AVICULTURAL MAGAZINE

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Red-bellied Conure.

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THE JOURNAL OF THE AVICULTURAL SOCIETY
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RED-BELLIED CONURE

(Pyrrhura frontalis frontalis)

By A. A. PRESTWICH (Southgate, England)

François Levaillant (1801) depicted a parrakeet he considered a new species under the name *La Perruche Ara à bandeau rouge*. Shaw (1811) gave it the scientific name *Psittacus vittatus* and vernacular Banded Parrakeet ; and Latham (1822) similarly called it the Banded Parrot.

Vieillot (1817) bestowed its present specific name when he described it as *La Perruche à bandeau rouge*, *Psittacus frontalis*. (By rules of priority, *Psittacus vittatus* Shaw (1811) is antedated by *P. vittatus* Bodd. (1783).)

Peters (1937) gives the distribution as " Southeastern Brazil from eastern Minas Geraës and Espirito Santo to Rio de Janeiro ".

As usual, very little has been written about this Conure in the wild state. One of very few writers, J. F. Hamilton (1871), describing a small collection of birds made in the south of Brazil in the spring of 1869, says : " Very common. I met them frequently in the neighbourhood of maize-plantations, on which they commit great havoc. Along the Saõ-Paulo railroad flocks were frequently seen flying overhead." Not very enlightening ! But then field-collectors rarely are.

Possibly the first of this species to arrive in this country were the two purchased for the London Zoological Gardens in May, 1869 ; five were purchased in June, 1883, since when there have, of course, been others in the Collection.

D. Seth-Smith (1926) says : " I am informed that some of these Conures were offered for sale in London in 1898 ; and three specimens, two males and one female, were obtained by the writer on August 24th, 1903."

During the past fifty years just a few have been imported from time to time, wars and parrot ban permitting, and in 1924 a pair owned by W. Shore-Baily successfully reared a nest of four young ones, for which event the Society's Medal was awarded.

In July, 1952, several pairs reached England, and three pairs were

obtained for the "*Darenth-Hulme*" collection. One pair successfully reared three young ones last year, and the flock at present numbers seven, one adult and one young one having died during the winter.

This charming Conure has also been bred in France, 1919, Mme Lécallier, and 1920, Jean Delacour: Japan, 1928, Prince Taka-Tsukasa: Australia, 1952, Sir Edward Hallstrom: and Denmark, 1953, J. Dalborg-Johansen.

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* * *

A REMEDY FOR AIRPLANE WING

By CONSTANCE NICE (Chicago, Ill., U.S.A.)

In the summer of 1954, at the Delta Waterfowl Research Station, Delta, Manitoba, where my mother and I have spent several seasons raising young marsh birds from the egg to study their behaviour and development, I was asked by Dr. Martin Moynihan to look at one of his young Franklin's Gulls, because its right primary joint had started to turn out.

On examining both wings I discovered that the primary pin feathers were just starting to develop, and that the affected bone was noticeably more flexible than the normal one.

I told him what I had been told by Peter Ward, the head of the duck hatchery, and by two zoo men, that the underlying cause of the weakened condition of the developing bones was some unknown deficiency in the diet. I thought, however, that the immediate cause of the twisting of the joint was the weight of the developing primaries, and suggested that if the joint were taped into the correct position it might grow normally.

(The year before, when the wings of one of our hand-raised Franklin's Gulls were constantly slipping down, I had put them in the wing pockets several times, telling the young bird kindly but firmly to keep them there. The next day and from then on the gull carried her wings properly. I had been equally successful this summer with the only hatchery raised Blue gosling, although it was not particularly

tame. I think that these young birds, without close association with adults of their species, had never happened to discover the proper and comfortable adult method of holding their wings, but almost immediately adopted it when shown.)

Dr. Moynihan taped the joint into position with ordinary Scotch tape, just before putting all the young gulls to bed in the dark. Starting the next day, the joint was held in the correct position. He found this method completely successful on his two or three gulls whose primary joints had turned out.

It did not matter whether they were taped as soon as he noticed the condition or two or three days later, or whether the bird was able to remove the tape very quickly, or whether it stayed on for several hours. Sometimes he had to apply the tape for two or three nights over a period of several days before the bird held its wings normally.

In the case of our hand-raised Sora Rail, whose primaries were already at least half an inch long, I taped both her wings off and on over a period of a week. However, it was not till the last time that I observed her brothers and sisters carefully and tucked her growing primaries as far under her secondaries as they were holding theirs. The next day and thenceforward the Sora held her wings correctly.

Also on Peter Ward's advice, Dr. Moynihan immediately bought a vitamin-mineral supplement, Polynutrin, and sprinkled it on the birds' food. None of the younger birds showed any indication of developing airplane wings.

We never taped the wing to the body, but just the primary in the proper position under the secondaries, and always removed the Scotch tape some time the next day, holding on to the feathers under the tape to try to keep from pulling them out or tweaking them. The birds often lost a few small feathers, but this did not spoil their appearance.

Whether taping the wings of a bird whose primaries had developed further would bend the joint into its proper position, and whether the bird would then hold it so, I have no idea.

In September, 1954, Dr. Konrad Lorenz told me that he treated airplane wing by making a roll of Scotch tape with the sticky side out, and putting the upper side under the secondaries and sticking the sheathes of the developing primary pinfeathers on to the lower side of the roll, so the primaries were held in the correct position. The tape was left in place until it dropped off with the feather sheathes.

This method should be less annoying to the birds than having the tape wrapped around the outside of their wings, and it certainly would be less trouble to have to tape the wing only once.

* * *

NOTES ON FERAL PIGEONS

By DEREK GOODWIN (Virginia Water, Surrey, England)

The Pigeon (*Columba livia*) is among the commonest of birds in British towns, as well as elsewhere throughout most of the temperate and tropical regions of the world. Ornithologists have, however, tended to ignore this species wherever its populations were derived from or interbred with domestic stock. Finn (1921) in his book on London's birds, included it under the name "Common Pigeon", a very apt one, as this bird is *the* Pigeon of the layman. Unfortunately, Fitter (1945) used the name "London Pigeon" and later he and Richardson (1952) misleadingly applied it to all feral pigeons, irrespective of locality or origin. Naumann (1833) gave a most interesting and detailed account of the status and habits of feral, dovecote, and domestic pigeons in Germany, and Darwin (1859 and 1868) dealt with the appearance and distribution of dovecote and domestic pigeons throughout the world. The present paper deals chiefly with observations on feral birds, but some notes on wild birds are included, and most of the behaviour patterns described are, of course, common to all members of the species.

The following terms will be used to designate different categories of *Columba livia* :—

Rock-Pigeons—wild populations of *C. livia*.

Dovecote Pigeons—pigeons nesting or roosting in dovecotes, pigeon-towers, barns, etc., exploited by their "owners" for food (young pigeons) or dung, but not selectively bred or confined in any way, and not usually fed by their owners.

Feral Pigeons—pigeons living in a free and ownerless state, but which have originated from Dovecote or Domestic Pigeons.

Domestic Pigeons.—Pigeons kept under a greater degree of control subject to selective breeding by man and fed by him.

Homing Pigeons.—Any domestic pigeons kept and bred for their ability to return home when released at a distance. Such birds are usually subjected to rigid control and selection by man, and regularly fed. The breed now used for this purpose in Britain (and elsewhere) is known as the Racing Pigeon or Racing Homer. The Carrier Pigeon is a purely fancy breed, and has been so for at least two centuries.

Flying Pigeons.—Any domestic pigeons kept for the entertainment they afford their owners by their flying when liberated. This may consist of height and duration of flight (tipplers, cumulets), or aberrant forms of flight (tumblers, rollers, sharpshooters). Many fancy breeds have been derived from Flying Pigeons, and still bear the same names. (For example : Long-faced and Short-faced Tumblers,

Exhibition Flying Homers, and Show Homers.) These breeds are subject to control and selection, and are usually kept closely confined except when liberated to perform.

Fancy Pigeons.—Domestic Pigeons of any of the numerous breeds and sub-breeds that are kept and bred solely for their appearance and to conform with some artificial " standard of excellence ". Many of these birds are monstrosities, incapable of feeding their own young owing to their abnormal skull and bill structure.

Pigeon.—The species *C. livia*, where the remarks made apply equally to wild, feral, or non-monstrous domestic birds.

The Origin of Feral Pigeons.

That all Domestic and Dovecote Pigeons owe their origin to the Rock Pigeon (*Columba livia*) and to no other species is fully established (Darwin, 1868). I have met many ornithologists and pigeon-fanciers who doubted this fact, but none has any valid evidence to the contrary. Fertile hybrids have been produced between *C. livia* and some other species of *Columba* (notably and rather surprisingly, the Woodpigeon (*C. palumbus*) among them), but the domestic breeds show no trace of such hybrid ancestry. Where they differ most from the Rock-Pigeon they differ equally from all other wild species. That the markings or structural developments of some Domestic Pigeons show similarity to those of certain wild species not even con-generic with them is of no significance in this respect (see Darwin, 1868).

The existence of clearly differentiated breeds of Domestic Pigeons dates back at least to Roman times (Darwin, 1868), but the practice of keeping, or rather exploiting, Dovecote Pigeons has, at any rate until recently, been practised on a far larger scale than the breeding of domestic varieties. Such Dovecote Pigeons were (and usually still are) very similar to Rock-Pigeons in type. In England and Western Europe (and doubtless elsewhere) they were mostly either of the natural blue colour or " blue chequers ", " dark blue chequers ", or " velvets ", that is birds showing varying degrees of melanism resulting in the wing-coverts being spotted with black on a grey ground, predominantly black with some blue-grey spotting or completely black. There is some likelihood that " chequered " birds may occur among wild Rock-Pigeons (Darwin, 1868, Petersen à Botni and Williamson, 1949), but no proof, as such birds have always been observed in areas where it is possible that feral or domestic birds could, at some time, have interbred with the wild ones. Conversely, of course, it is only in such places that the occurrence of aberrant specimens is likely to be noticed.

The Feral Pigeons of most parts of the old world appear to have been derived originally from Dovecote Pigeons that strayed to find homes for themselves, with a slight admixture of strayed or lost

Domestic Pigeons. Of the latter, only such as approximated to a Wild Pigeon in form and ability would have survived *and successfully reared progeny*. Hence the general similarity of Feral Pigeons to Rock Pigeons rather than to the various Fancy Pigeons is because, for the most part, they are descended from birds equally like the wild stock. There is no need to postulate some hypothetical and semi-mystical " reversion to the wild type ". In the past century, and more especially in the last fifty years or so, the widespread popularity of pigeon-racing has had an enormous effect on the feral population of Britain. Homing Pigeons get lost in large numbers during training and racing. Most of them are physically capable of getting their own living and many which appear psychologically incapable of fending for themselves in the fields are able to adapt to the more directly parasitic role of " town pigeon ". In Britain (as in many other parts of western Europe), the resultant constant influx of lost Homing Pigeons has coincided with a widespread elimination of Dovecote Pigeons by man, and with continued periodic destruction by him of large sections of the feral population. Because of this the Feral Pigeons in many places are now predominantly of Homing Pigeon type.

As was pointed out by Darwin (1868), Dovecote Pigeons normally show characteristics in common with the Rock Pigeons of the same geographical area, particularly as to the colour (white or grey) of the rump. Hartert (1912–1921) considered Domestic Pigeons to have originated separately in various places from different sub-species of Rock-Pigeon. This is doubtful. It is known that many of our Flying, Homing, and Fancy Pigeons were first brought to Europe from the Middle East or India, and it is likely that such breeds as were " made " in the west were derived from these already domesticated birds rather than from pristine wild stock. Dovecote Pigeons may have been derived independently from local wild stock. On the other hand, their resemblances to the local Rock-Pigeons might be due to interbreeding with them, or to similar environmental influences being at work on the Dovecote Pigeons as on the wild ones.

Sociability and Segregation of Populations.

In all its activities that are not purely reproductive, the Pigeon is gregarious. It does, however, like most social birds, defend its roosting perch and an area around the nest which varies in size according to circumstances. For a detailed account of sexual and aggressive behaviour see Heinroth (1943). This sociability is not simply a matter of many birds wishing to exploit good feeding, bathing, or resting places at the same time. The lone Pigeon will actively seek a companion to rest near. A good example was given by a female in my possession, which I hand-reared after it had fallen from its nest. When it began to fly about it soon discovered some Barbary Doves

(*Streptopelia risoria*) in one of my aviaries. Previously it had spent most of its spare time in a shed where it roosted, or in an adjacent garage. After finding the doves it did all its day-time resting and preening perched above them on the wire roof of their aviary. If they were not in the open part, but in the shelter, the Pigeon rested on a ledge outside their shelter window, through which it could see them. This Pigeon is blue, its parents were a blue and a blue chequer. It had never in its life seen a Pigeon of similar colour to these doves, yet it evidently recognized them (? by shape and movement) as " the nearest thing ". It was not at that period reacting sexually to the doves, but regarded me as its mate, and left them to seek my company whenever I appeared.

That Feral and Domestic Pigeons interbreed in many cases with Rock-Pigeons is familiar to all, since it is mentioned, often emphasized, in most accounts of the species. The far more interesting fact that in many places there is very little interbreeding—relative to the apparent opportunities for it—between Feral, Dovecote, and Rock-Pigeons on one hand and Domestic Pigeons on the other has received little attention, although it was remarked upon (Adams, 1864) briefly nearly a century ago. This is very noticeable in the Nile Delta, where the Dovecote and Feral Pigeons are very similar to the local Rock-Pigeons (*C. livia schimperi*), but the Domestic Pigeons are mostly much larger and white, pied, or red in colour. Such relative segregation may arise, partly through birds tending to pair with those in the same colony (though I know no proof of any such tendency), partly through human interference, but also partly, I think, through the preferences of the birds themselves. It is known that in many species of pigeons and other birds, recognition of their own kind is not innate, but occurs through the young bird identifying itself with the creature which has reared it and/or with which it has been reared. This is probably true for *C. livia*. It is certainly a fact that the young Pigeon will often show a strong preference to pair with another similar in appearance to those which reared it, or among which it spent its early days. Such preference may be most striking in members of the more unusually coloured domestic breeds and is generally thought to be due to their being " instinctively " drawn to their own aberrant kind. It is, however, a result of " imprinting " ; such birds only show this trait if they have been reared by, and spent their youth with, pigeons like themselves.

Thus whenever the majority of Domestic Pigeons differ appreciably in appearance from the majority of Feral (or Rock or Dovecote) Pigeons it is likely that barriers to interbreeding arising from differences in ecology will be reinforced by the acquired mating preferences of the birds. In countries, such as Britain, where the keeping and racing of Homing Pigeons is practised on a large scale,

the situation is very different. Here thousands of lost Homing Pigeons are scattered widely throughout the country every spring and summer. The vast majority of those which survive join other Domestic Pigeons or Feral Pigeons in towns, but presumably some join cliff-dwelling Feral or Rock-Pigeons. A lost Homing Pigeon that joined a flock of Rock-Pigeons would perforce have to accept one of these as a mate.

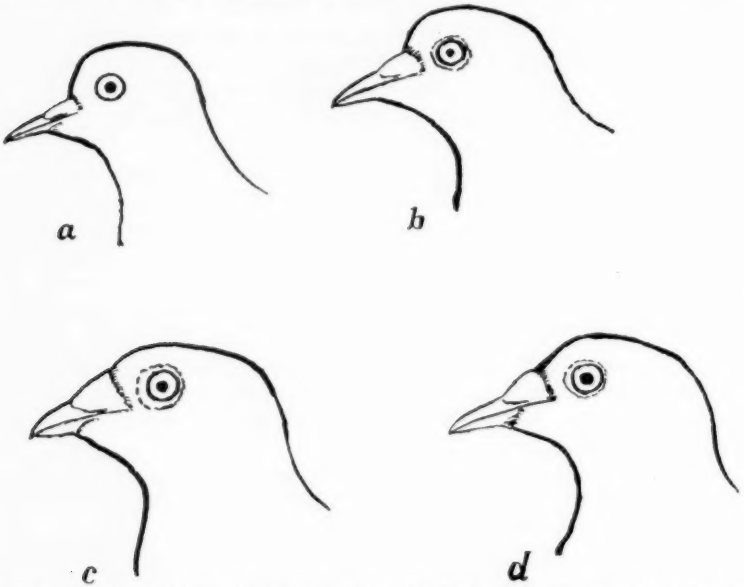

FIG. 1.—Heads of (*a*) Rock Pigeon (male); (*b*) Typical Feral Pigeon from London (male); (*c*) Typical Homing Pigeon (male); (*d*) Typical Homing Pigeon (female).

Since it would be used to seeing companions of this colour—among others—it would have no aversions to so doing. Apart from colour (which in many is identical with or similar to that of the Rock-Pigeon), a Racing Homer differs from the wild form being larger, having a proportionately heavier bill, larger cere (called "wattle" by pigeon-fanciers) and more bare skin ("cere" of pigeon-fanciers) round the eyes. It is unlikely that these differences would deter a Rock-Pigeon from pairing with a Homing Pigeon, at least if the latter were blue or blue-chequer in colour. Indeed, it is conceivable that if the Rock-Pigeon were the female and the Homing Pigeon the male, their differences in size and head proportions might be mutually attractive rather than otherwise. The difference between them being, in effect, an exaggeration of the normal sexual dimorphism, which is slight in the Rock Pigeon but more pronounced in most strains of Homing Pigeons.

Despite its theoretical probability, however, there seem to be few actual records of mixed pairs of Rock and Feral Pigeons. In a brief trip to the Shetlands last June, I saw apparently pure Rock-Pigeons within a mile of Feral Pigeons that showed no trace of wild intermixture. Mr. W. B. Alexander informs me that he suspects that small groups of Rock-Pigeons still exist in some of the Yorkshire and Welsh cliffs, maintaining their purity in spite of the large Feral Pigeon populations in the same areas. It is quite possible that where Rock-Pigeons have been replaced by Feral Pigeons this has been achieved through their " going under " in competition with the latter rather than extensive interbreeding between them. For example, safe rain-proof nest-sites may often be scarce. Where this is the case a pair that can obtain and hold such a site will, in the course of a very few years, rear many more young to independence than will a dozen other pairs that are forced to " make do " with inferior nesting places.

Some Local British Populations.

In some instances these observations are little more than impressions based on brief visits of only a day or two. They are in such cases offered very tentatively rather to stimulate further investigation than for any other reason. The dates and duration for which such populations have been under intermittent observations are given in brackets.

Inner London (1936–1940 and 1947–1954).—Here the Pigeons show every intergradation between a small minority almost if not quite identical in type with the wild form and a much larger minority which, although unringed, are to all appearances pure Homing Pigeons. The majority are about mid-way between these two extremes, but inclining to Homing Pigeon rather than otherwise. On the whole the smaller Dovecote Pigeon types are more numerous in the most central districts, suggesting that the influx or establishment of lost Homing Pigeons has been greatest in the peripheral areas. I have never seen a ringed bird (" first generation homer ") among the small parties, pairs or singletons that one finds busily *searching* for food in back streets, railway stations, etc., and hardly ever failed to spot one or more in any flock waiting to be fed in a park or square.

I have dealt elsewhere (Goodwin, 1952) with the colour-varieties of London's pigeons, but must emphasize here that there is no correlation between colour and type. Homing Pigeons, or for that matter Fantails, may be identical in colour with wild birds.

Windsor.—Most, if not all are of Homing Pigeon type, some individuals are, however, rather neater and smaller than most Homing Pigeons, and may represent Dovecote Pigeon origin.

Scarborough (April, 1940–June, 1940, and November, 1945).—In 1940 there were about a dozen birds of Homing Pigeon type living in the castle ruin on top of the cliff. When I returned in 1945 the colony

had increased to at least two hundred, probably many more. These birds fed inland during the day and returned during the afternoon and evening to roost on the cliff ledges. Most of the roosting places offered little shelter and I saw no pigeons entering any of the holes or crevices, all of which seemed to be owned and defended by Jackdaws. All the pigeons seen at close quarters were Homing Pigeons or their immediate descendants.

Bristol (*September, 1953, and May, 1953, two days only*).—Here, as in London, I got the impression of stocks derived from a Dovecote Pigeon nucleus, now in process of being swamped out by Homing Pigeons. A small colony near the station were largely of Dovecote Pigeon type, had they been a little smaller one or two of the blues could have passed for Rock Pigeons. Most other birds seen were, however, close or identical to Homing Pigeons, and ringed birds were plentiful.

Lerwick (*June, 1954, two days*).—The many Pigeons I saw in the streets and about the dock were of Homing Pigeon type. About half were racers bearing rings. Most of these appeared to be having a hard time, and their tails had been pulled out. About a dozen pairs of Pigeons were nesting in some boxes fixed to an old barge not far from the harbour. These were of mixed Dovecote Pigeon and Homing Pigeon type. None of the birds showed any signs of inter-breeding with wild stock, and there were no aberrant birds among the Rock Pigeons I saw on Noss and Bressay near by. I did, however, see a blue Pigeon and a black pied flying together below the cliffs a short distance from Lerwick, but was not close enough to see whether the former was a Rock Pigeon or a blue Homing Pigeon. Lerwick is a major liberation point for pigeon-fanciers who fly " the north road ", so that there is likely to be a constant addition of Homing Pigeons to the local population.

Predators and Competitors.

There can be little doubt that the most important non-human predators of adult Rock-Pigeons are falcons, particularly or perhaps mainly the Peregrine (*Falco perigrinus*). I have never seen Rock or Feral Pigeons attacked by falcons, but I have seen a good many pursuits of Homing Pigeons by the Lanner (*Falco biarmicus*) in Egypt. The Lanners are hardly so swift or strong as Peregrines, and I think they were usually attracted because the circling of our " nomad " Pigeons, about a basket in the desert, suggested an exhausted or injured bird to them. When pursued the Pigeon would usually fly low and swift, jinking slightly sideways or downwards at the moment that the Falcon struck or attempted to seize it. The Lanner invariably missed at its initial stoop, and then would sometimes rise for another attempt, but more often would chase the Pigeon in swift, low flight. Often the Lanner on overtaking the Pigeon would appear to fly right

over it. This, I think, was due to the Pigeon swerving downwards at the critical moment. The Lanners seemed unable or unwilling to keep hold of the Pigeon, as often the latter would be knocked to earth two or three times, yet finally escape. The chase commonly ended with the Pigeon managing to return and dive under the army truck or between our feet. When chased by a falcon, Homing Pigeons—which are usually very hesitant about entering any strange enclosed place—will dive headlong into any hole or shelter that offers. A few would dodge the stoops and circle upwards, trying to gain height. I imagine these tactics would prove fatal with a Peregrine, and they perhaps represent an abnormal response by domesticated birds. It is, however, amazing how stereotyped and perfect the escaping tactics usually are. I remember well my astonishment on seeing a young Homing Pigeon that had only been on the wing a few weeks and had never seen a falcon before, fleeing and dodging in typical manner as though it had practised escaping from falcons every day of its life.

These escaping movements are also used by the Pigeon when pursued by Sparrows. Both the House and Spanish Sparrows (*Passer domesticus* and *P. hispaniolensis*) have a habit of chasing pigeons and other large birds. The sparrow flies surprisingly fast close at the Pigeon's side, as if trying to peck it under the wing. The Pigeon behaves similarly to when chased by a falcon except that it does not go into shelter, thereby indicating that it is not so frightened as it appears to be. Cats, owls, Snapping Turtles, and various other creatures have been recorded as taking Rock or Feral Pigeons, but I have little or no personal experience of these predators in relation to them.

In towns, such as London, where they rely largely on bread given by the public, Feral Pigeons suffer much from the competition of other birds. They cannot carry off bread as a passerine or gull will do, nor can they swallow large lumps like a gull or duck, or easily peck them to pieces like a crow. The annual influx of wintering Black-headed Gulls greatly reduces the amount of food available to London's pigeons.

To what extent Feral Pigeons living in the country—and Rock-Pigeons—suffer from food competition from other species is unknown. One would think that both the Rook (*Corvus frugilegus*) and the Jackdaw (*Corvus monedula*) might exercise a considerable influence, as these species also feed largely on grain. The Wood Pigeon (*Columba palumbus*) is probably not a serious competitor since although fond of grain and weed-seeds when these are available in quantity, at other times it relies largely on acorns, nuts, berries, and greenstuff. The Stock-Dove (*Columba oenas*), however, appears to feed not only on the same fields, but actually on the same foodstuffs as country-living Feral Pigeons do. Much detailed and careful work will have to be done before it can be ascertained if, and to what extent, the two

species compete, but it seems at least possible that the remarkable increase of the Stock-Dove in Britain and western Europe during the past hundred years is not unconnected with the contemporary decrease in the numbers of Rock and Dovecote Pigeons. It would be interesting to know if there is any region where Rock-Pigeons and Stock-Doves are both plentiful, and if so whether they there share the same feeding grounds and compete for the same foods.

Relationship with Man.

Most Feral Pigeons are dependent on man-made buildings for their nesting and roosting sites. Man's reaction to their presence ranges from welcoming them as guests or even as sacred birds, as in many Buddhist and Muslem communities, to active dislike and attempts to destroy them in many western countries. In Britain and America the slight disfigurement of buildings by the birds nests and droppings is considered to justify their destruction.* Such destruction is usually of a sporadic or haphazard nature, undertaken by officialdom against the wishes of the majority of people. In London, at any rate, it has no permanent effect, the periodic mass destruction merely encouraging a higher breeding success in the survivors. As with man, so with the Pigeon, it usually happens that the fewer the number of individuals in any given area, the higher the standard of living which each enjoys. In country districts Feral Pigeons (and Domestic ones too !) may be shot for sport or to protect crops. They are, however, often spared by sportsmen who do not wish to risk shooting domestic birds. Most unfortunately Rock-Pigeons breeding in natural sites do not share this relative immunity. Many British pigeon-fanciers have a great dislike of Feral Pigeons, particularly if they approach Rock-Pigeons in appearance. Such men kill every ownerless Pigeon that comes into their lofts, and often deliberately decoy them down for this purpose.

Man destroys many of the Pigeon's natural enemies in his own interests, real or supposed. It seems likely, however, that even if he gave such enemies a free hand, the Feral Pigeons would show only slight diminution of numbers, and this would consist for the most part of inexperienced juveniles and birds suffering from disease, malnutrition, or injury. These latter often drag out a miserable existence for months or even years in districts—such as inner London—where predators are rare.

Much of the food of " town " Pigeons is deliberately given to them by man. Thus the subjective feelings of pity, friendliness, or compassion which they evoke in man (or woman) is of the utmost biological importance to them. The relative slowness of peristalsis in this species,

* Since I wrote the above, I have seen an American journal that concerns itself largely with bird-protection of a sentimental nature, carrying advertisements for a contrivance designed to cripple any Pigeon or other " unwanted " bird alighting on it !

and the resultant posturings as the hungry bird with gullet over-full (but crop and stomach probably empty) endeavours to avoid having to throw up some of the swallowed food (see sketch) often makes the superficial observer consider them as extremely "greedy". As a result of this, and perhaps also of official anti-pigeon propaganda,

FIG. 2.—Hungry Pigeon with gullet crammed but crop empty.

some of the people who feed the birds in London's parks make every endeavour to prevent the Pigeons obtaining any of their bounty. Even in country districts, Feral Pigeons are largely dependent, albeit indirectly, on man, since most of their feeding grounds are produced by his activities. The same is true to some extent of Rock-Pigeons. A study of the feeding ecology of Rock-Pigeons in areas where they do not use man-made feeding grounds would be of utmost interest.

Feeding Ecology.

From this aspect Feral Pigeons can be roughly grouped into two main classes; those feeding in the countryside and those feeding inside towns. In their feeding habits the first group do not differ from such Dovecote Pigeons or Rock-Pigeons as may be getting their living in the same area. Feral Pigeons dwelling in cliffs, ruined buildings (in the country), old barns, quarries, and similar places get their food outside the towns, but the converse is not always true. In some towns all or part of the Pigeon population may fly out into the surrounding country to feed, returning to roost and nest on the buildings. The same individuals may—though not very commonly—feed both inside the town's streets and in the surrounding fields.

Food is sought on the ground. Pigeons normally alight to look for food only where the earth is either bare or covered only with short or scanty vegetation. Cultivated land, particularly arable fields and stubbles, is usually chosen where available. Fields of hay and corn are visited as soon as they have been cut, but the birds do not often settle among standing corn, as does the Wood-Pigeon (*Columba palumbus*). They may come into stackyards and about farm buildings, particularly if Domestic Pigeons are kept there. They may even under certain circumstances (Naumann, 1833) feed in woodlands on the fallen seeds of conifers and other trees. Exceptionally they may feed

in trees on growing buds or berries. This I have only seen in Kensington Gardens, but it has also (Szemere, 1948) been recorded in Hungary. This is probably an acquired habit which perhaps originated by a bird which had perched in a tree to rest, observing a Wood-Pigeon or some other bird feeding.

Besides seeds of many kinds, some of the more quiescent forms of animal life are also taken, particularly small snails. Cultivated grain (especially wheat) and pulse and the seeds of vetches are favourite foods. In Kensington Gardens they habitually search for and eat such acorns as are, or can be, broken up. Naumann (1833) observed Pigeons swallowing whole acorns. This I have never seen, and all my efforts to get the Kensington Garden birds to do so have been in vain. That they are perfectly capable, physically, of swallowing and digesting small whole acorns I have proved by feeding them to a young one that I was hand-rearing, whilst it was still at the stage when it would blindly swallow anything I put into its mouth. For a comprehensive list of foods taken by Feral and Dovecote Pigeons in Germany and by Rock-Pigeons in Scotland, the reader is referred to Naumann (1833) and Macgillivray (1837).

Feral Pigeons living in towns often, and in England usually, feed inside the town itself. Some natural food is obtained from exposed earth or grass plots in parks and gardens, but the greater part consists, as a rule, of bread or other artificial food which is given to them by the public, or obtained by scavenging. Large numbers congregate in parks and squares where they are regularly fed. Others seek food in the roads, railway stations, dockyards, and so forth. Grain spilled from horses' nose-bags once constituted an important food source, but owing to the decline in horse-traffic it is now a negligible one in most places. Bread is usually the staple food, since being cheaper it is given in greater quantity than any other, but grain, pulse, peanuts, or cheese are always taken in preference except by individuals that have not learnt that these substances are edible. Cooked meat, fat, bacon rind, apple, potato, chocolate, and other sweetmeats are also eaten, at least by some individuals. The need for lime, especially by breeding birds, prompts them to eat the mortar from buildings. This they can only do where it is already sufficiently loose and crumbled for their weak bills to detach pieces of suitable size. The popular idea, largely spread by professional pigeon-killers with an axe to grind, that they are capable of harming sound buildings in this way is, of course, ludicrous.

Feeding Behaviour and Recognition of Food.

It would be of great interest to know to what extent (1) likely feeding grounds, and (2) food, are recognized innately. Normally the young Pigeon follows older birds to the feeding areas. Similarly adult birds

are often attracted to new feeding grounds by seeing other pigeons flying to or alighting on them. In any flock there are usually experienced birds who will probably " recollect " previous experience at sight of a new-cut stubble, new-sown cornfield, or other man-made feeding ground. A pigeon usually remembers any place where it has found food and returns to it again next time it is hungry. It seems that, in the absence of the greater stimulus of experienced birds going elsewhere, Pigeons instinctively alight on relatively bare ground and away from the immediate vicinity of trees when seeking food. It seems certain that they have an innate tendency to go to the ground when hungry, for hand-reared young ones *that have never been fed at ground level* will do so if left without food. Probably nobody would have thought of putting food for pigeons in the many barren town squares where they are fed, had not hungry birds first alighted in them to search for food.

Pigeons feeding in open country commonly set off for their feeding grounds in flocks, although they may do so singly or in the company of only one or two others. They usually fly fairly low, and on arriving at the feeding ground alight either at once or after some preliminary circling. This latter hesitation is due to the birds being somewhat afraid to alight or undecided exactly where to do so. It is not a deliberate attempt to make sure that no enemy is concealed near by.

Such hesitation is seldom shown if the birds are very familiar with the feeding place, or if there are other Pigeons already feeding there. Once on the ground the birds walk about rapidly with heads down, peering closely as they go, and stopping or turning aside to pick up anything edible they see. In loose friable earth, leaf-mould, chaff, etc., pigeons (all species of *Columba* and *Streptopelia* whose feeding behaviour is known as well as the present species) will search for buried seeds by turning over the substrate with their bills. The bird uses a quick sideways flicking movement of the head, whereby some of the loose earth is thrown to one side. Although less like the normal movement of picking up food, and hence one might suppose more specialized, this movement does not seem any more efficient than the " pecking with closed bill " of gallinaceous birds. Pigeons do not often dig in this manner except where they have already found some grains or have been accustomed to find them.

Homing Pigeons and Flying Pigeons that are allowed their liberty frequently go into the fields to feed in spite of regular and plentiful supplies of food. This habit most often starts when they are feeding young. They are generally believed—probably correctly—to do so in search of snails and other animal food. If this is so, it suggests an innate urge to seek such foods—which are not normally sought after—even though the diet supplied is sufficient to rear apparently perfect young. Any reader who keeps Homing Pigeons which have not

hitherto "gone fielding" could make valuable observations by noting full details about its first occurrence, where the birds first alight, and what appeared to induce them to do so.

Pigeons feed by preference mostly on seeds, which are swallowed whole. There would seem to be no possibility of a sense of taste in any way similar to our own, giving the bird clues as to the edibility of new objects. Adult pigeons make no attempt to "show" food to their offspring at any stage. The method of parental feeding does not enable the young one to see the food it swallows, and under normal conditions the young pigeon does not appear actively to seek food until the parents have ceased to feed it.

A young Pigeon will, if hungry, and if no creature from whom it is accustomed to be fed is within sight, commence to peck at all sorts

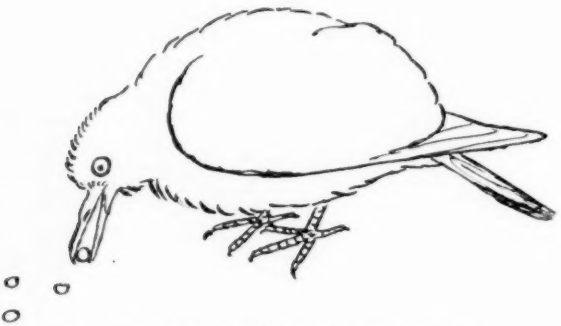

Fig. 3.—Starving "squeaker" beginning to feed.

of small objects that contrast to some degree with the substrate. These are picked up, held a moment in the tip of the bill, and dropped again. If some edible seeds, such as grains of wheat or dari, are found, the bird will almost invariably eat them. The first grain to be eaten will, however, be picked up and dropped again many times before it is finally swallowed. The second will be taken with much less hesitation, and the third—if the young Pigeon is really very hungry—probably with none at all. Whatever items are first swallowed will, at this first meal, be taken exclusively until they are all gone. This behaviour does not seem to be on quite the same plane of trial and error as the feeding of young game-bird chicks, since the young Pigeon does not usually swallow inedible substances. It may indeed refuse—even though starving—to eat many palatable foods at this stage.

If other Pigeons are present when the young one first starts to feed itself, its behaviour is somewhat different. It shows interest the moment it sees another Pigeon pick up food. The young bird at once runs to it, looks eagerly when it pecks again, and tries—always

unsuccessfully—to take the morsel from the other's bill tip at the moment it is picked up. This will be repeated again and again (perhaps interspersed with vain but frantic outbursts of food-begging), and one has the impression that the young one " knows " that the morsel actually taken by the old bird must be edible, but does not realize that other similar grains, over which it may be treading as it tries to seize the one in its unwitting mentor's bill, are equally so. Suddenly (perhaps as a result of clearly seeing the actual morsel the other picked up) realization comes, and the young Pigeon starts to eat, usually with much less hesitation over the first grain than it would have shown had it been " learning to feed " alone. None of the hesitation shown by the young Pigeon at this stage is due to insufficient maturation of the innate feeding movements. In a natural or feral state the young one does not feed itself until after it can fly well, and has left the nest. It can, however, as every pigeon-keeper knows, be taught to eat freely long before it can fly, by placing a supply of corn beside the nest, so that it constantly sees its parents feeding themselves. Also adult Pigeons confronted with some food new to them behave in the same manner except that they are—other things being equal—usually " quicker on the uptake ". There is much individual variation in the speed of both adults and young when " learning " new foods.

Pigeons do not learn to eat bread so readily as they will seeds. Nevertheless, they soon do so if they are famishing and other Pigeons are eating it. Chopped-up cooked meat, another unnatural food like bread, but one that is given very little by the public, has been learnt by very few Pigeons (in London, at any rate) which will leave bread to scramble for it whilst the majority ignore meat if there are known foods, such as bread, available. Pigeons always " learn " more quickly to take strange seeds of small size—millet, dari, wheat, canary seed, hemp, etc.—than larger ones such as maize, tic beans, or shelled peanuts. This bears no relation to their choice when " experienced ". It is difficult to see the utility of this behaviour. It can hardly be to guard against the ingestion of unsuitable food, since once it has convinced itself of the edibility of some new food and swallowed the first morsel, the Pigeon will always continue to eat. Thus it will—if there is enough available—consume as great a bulk of a food consisting of small particles as of larger.

Since the war the Pigeons in inner London have been fed chiefly with bread. Knowing that Pigeons that have once learned to eat them usually take peanuts in preference to other foods, I experimented by giving peanuts and millet to many different groups of London's Pigeons. It was obvious that the birds had no previous experience of millet. Its unfamiliar appearance when thrown to them often made them fly up in alarm and show fear when approaching the millet-strewn ground. Most have, however, eaten the millet after

only the briefest hesitant " picking up and dropping " and with two exceptions (out of very many hundreds tried), all the individuals to whom it was offered ate it within a few moments of the first birds to do so commencing. With peanuts (shelled but whole) the results have been otherwise. Of the birds which obviously did not " know " peanuts, many have refused them, often after picking them up several times. The majority of Wood-Pigeons to which I offered peanuts would not even pick them up, although the very few that " knew " them took them eagerly in preference to anything else. To my astonishment, a starving young Wood-Pigeon, so weakened by hunger that it tottered and stumbled repeatedly and showed no escape reactions, repeatedly refused to swallow even broken-up peanuts (which inexperienced pigeons take at first more readily than whole ones, because of size), although repeatedly seizing them eagerly when thrown to it and lifting and dropping them. This bird could not have been flying more than three weeks, it had learnt to eat bread, but had evidently not succeeded in finding sufficient food.

A young Feral Pigeon which fell from its nest (in South Kensington) when about three weeks old, was hand-reared, chiefly on milk-sop, wheat, peanuts, and millet, although it was also fed small amounts of meat, cheese, crushed egg-shell, grit, and acorns. After it had reached the age when it would normally have been fully independent (I had deliberately made no attempts to encourage or coerce it into feeding itself) it would no longer let itself be fed sop (which nestling pigeons take more eagerly than dry grain), closing and withdrawing its bill if it felt sop in my hand, but opening it and gulping eagerly if it felt grain or peanuts. At this period it began to pick up and swallow wheat or millet grains that were spilled during feeding. When I " pecked " at a peanut with my finger the bird immediately showed interest, but I had to repeat the process for several days running before it at last swallowed one of its own accord. Thereafter they became its favourite food. It did not eat bread—in spite of attempts to make it do so extending over several weeks—until I had kept it without food for some thirty hours. During this time bread, suitably broken up, had been available in dishes from which it habitually fed, but had been untouched. The bird was by then very hungry, but by no means near starvation point, and after a great deal of finger tapping and proffering bread in my hand, I at last persuaded it to eat a little. This specimen had come from a bread-fed population and the relative slowness with which it learned to eat this food suggests—as does observation of their condition—that the majority of " squeakers " in London are actually starving when they first learn to feed themselves. The same may be true for wild pigeons.

The above examples (and many similar ones that might be quoted) suggest that seeds from about millet to pea size present *C. livia* with

innately recognized visual and possibly also tactile stimuli. Such foods as bread seem to supply no such stimuli. Most Pigeons first begin to eat them through the example of others. Some individuals may learn to eat such foods either through extreme hunger inducing them to sample it or because it is offered by a human being from whom they are conditioned to expect edible gifts. Initially some bird or birds in each area *must* have learnt to eat bread in some such manner. Nevertheless, Pigeons that are starving may, *in the absence of others which take them*, refuse such foods as bread and peanuts if they have never seen them before. This they may do after repeatedly picking them up, holding them in the tip of the bill, and dropping them, thus showing that this behaviour pattern is not—as it often appears to be—a means by which a Pigeon can deduce the edibility of any object. It is true that Pigeons often discard bad grains (of a species they are accustomed to eat) after such treatment, but this may be due to the bird appreciating the difference between the visual and the tactile stimuli after it has learnt what " good " grains look and feel like. Jays (*Garrulus sp.*) and Wood-Pigeons will at once discard a bad acorn after similar treatment.

The eating of and apparently deliberate searching for invertebrate life sometimes shown by Pigeons that are feeding young, suggests an innate impulse to find such food and to be able to recognize it when found. It would be interesting to know whether this is a result of the birds being in a certain phase of the reproductive cycle or whether it depends on the diet being deficient, to some degree at least, of food elements needed at this period. I have noticed that captive Pigeons of many species are eager for such foods as cheese, cooked egg, and milk-sop when they have young. A pair of Turtle Doves (*Streptopelia turtur*) which I kept many years ago, and on which I made no precise or written observation, fed chiefly if not entirely on seeds except when feeding young, at which time they ate quantities of milk sop. A pair of Palm Doves (caught as adults) which I kept in Egypt (Goodwin, 1947) fed entirely on maize until they hatched their young, when they commenced to take broken-up peanuts and lentils—both foods of high protein content—as well. Whitman (1919) found that most of his pigeons would eat earthworms at this period, possibly their diet was somewhat faulty and the many weaknesses which he ascribed to hybrid ancestry may not always have had this as a sole cause. I have never known pigeons eat earthworms—though I have offered them to many species—but I strongly suspect that the London Wood-Pigeons do so.

The eating of greenfood (leaves and shoots of various plants) may perhaps often be due to an otherwise deficient diet. I have never seen Pigeons in the country eating greenstuff and none of the Domestic Pigeons I have kept have eaten it except in very small quantities.

On the other hand I have seen Domestic Pigeons that would devour cabbage, lettuce, and other greenstuff avidly. Some in the Cairo Zoo during the war years appeared to be fed on nothing but white maize, and these poor birds would fly madly to the wire to devour anything green offered to them, swallowing leaves, stalks of dandelions, and so on, in a manner unlike anything I have seen before or since.

Roosting, Nesting, and Related Behaviour.

Rock-Pigeons nest and roost in caves. Where available sea-caves appear to be preferred, probably a result of selection through survival, because persecution by man has fallen less heavily on populations in such sites. The nest is placed either on a ledge in a cave, or, less often, in a hole or crevice in the cliff-face. The nest-site is often in semi-darkness and usually well inside the cave. Little detailed evidence about roosting is available. On Fetlar, in the Shetland Isles, I was shown a very large, almost cathedral-like cave, from the roof of which depended large sloping ledges of rock. There was no place in this cave where a Pigeon could have nested, yet large numbers had evidently used it as a roosting place for many years. None were " at home " when I visited it (on an afternoon in late June, 1954), and it is possible that it was only used by non-breeding birds. In a small dark sea-cave occupied by an incubating pair, the cock roosted on a ledge near the nest. Much remains to be found out about the behaviour of the truly wild Pigeon, and a comparative study of feral populations is equally desirable. In some parts of the world Rock-Pigeons have taken to living in buildings. Where doing so their habitat preferences do not seem to differ from those of Feral Pigeons.

The roosting and nesting places chosen by Feral Pigeons are, in effect, the nearest artificial equivalents of natural sites. The girders under bridges, church belfries, ruined buildings, large railway stations, and old castles are commonly favourite haunts. Any sort of suitably sized hole, nook, or sheltered ledge may be used for nesting. If they fail to find any better place, a pair will sometimes nest on an exposed ledge, usually without success. Although the favourite roosting perch would seem to be the equivalent of " a ledge in a big cave " the birds often roost regularly on ledges or roofs with no shelter from above. They never roost " on the skyline " (although lost Homing Pigeons may, exceptionally, do so), but always with a solid wall of some sort on one side of them.

What are the essential " sign stimuli " that guide a Pigeon in its selection of a nesting or roosting site ? That remains a question that perhaps some of our members will be stimulated to solve, and I can only offer some tentative suggestions. Pairs of Pigeons seeking a nesting site seem strongly attracted to any conspicuous " dark opening ". I have often noticed in London that when new blocks of

flats are being built and have been nearly completed, but with empty spaces where the windows will be, nest-seeking Pigeons frequently enter them and attempt to breed. Whenever I have kept Domestic Pigeons a pair has sooner or later found the open trap-door of the garage loft—which from below appears a square black hole—and nested therein. Whether height, as such, in a building or cliff has any attraction for Pigeons—over and above that occasioned by its mere conspicuousness—I do not know, but am inclined to doubt it. Height after all is a relative matter, and the Rock Pigeon must usually after foraging fly downwards when it returns to its cave. For the actual nest itself, Pigeons like to get in some sort of hollow, or depression if on a ledge, this obviously being related not only, or not so much, to the greater security as to making the somewhat ill-constructed nest " stay put ". Taking advantage of this some pigeon-fanciers put earthenware nest-bowls in large and bare nesting boxes, and birds nest in them as the most suitable place available.

In contrast with the energy with which they will search for a suitable nesting place, Feral Pigeons often seem to lack initiative over roosting places. The many birds that one sees roosting night after night exposed to wind and rain could in most cases find better places, but once having established the habit of roosting in a particular place, it never seems to occur to them to seek for a better one. They will, however, often desert their roosting place if they are *frightened* at it by man or some other predator. What causes apparently unsuitable roosting places to be initially chosen is difficult to understand. Roosting on exposed ledges seems to be rather more general with Feral Pigeons of Homing Pigeon type and ancestry, but this may merely be because these tend to be more numerous in smaller, newer, towns with relatively few buildings that offer shelter. The disinclination to seek a fresh roosting place, except under the stimulus of fear, is easily explicable. So long as the bird remains alive and fit for reproduction, there will be no selection against individuals that stick to an accustomed roost in spite of discomfort. Indeed, since such a roost has for some time " proved safe " there may well be selection in their favour.

On the other hand there will be selection in favour of pairs that show initiative in seeking a suitable nest site, since the apparent optimal site for the adult—sheltered and in semi-darkness—is that where the young are most likely to be successfully reared. It may be mentioned that although in a pigeon-loft pairing often or usually takes place through a hen being attracted by a cock " calling to nest ", yet it is evident that in a feral state many pairs form prior to either partner having secured a nest-site. Also one can, of course, pair a cock and hen Domestic Pigeon just as surely (and a good deal more safely) by leaving them free *outside* the loft together by themselves as by shutting them in the male's nest-box.

The nesting behaviour of Pigeons is well-known and has been described in some detail by many authors, correctly by Heinroth (1948), and with varying degrees of inaccuracy by most others. One point about the parental feeding, that so far as I recall is not mentioned by Heinroth, should be discussed, as it applies equally to other species of *Columbidae*, and is of importance to aviculturists. The parent at first feeds the squabs with pigeon's milk that forms in the upper part of the crop. When they are a few days old it begins

FIG. 4.—Pigeon feeding small young (from front).

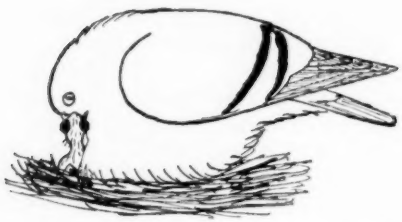

FIG. 4*a*.—Pigeon feeding small young (from side).

also to regurgitate the food in its crop, of which the young can at this age swallow only small or soft morsels. If one watches the parent feeding one will see that after each regurgitation it re-swallows some food in its gullet. At about four to five days old the squab's crop will contain pigeon's milk plus some small seeds (if these have been available to the adult), and perhaps some soft food or animal matter. A little later the young one can and does swallow anything the parent regurgitates.

The pigeon's milk, I suppose because it lies above the food in the main part of the crop, is fed off first at each feed. If both squabs are equally vigorous, both will get a share. Indeed, the parent often feeds both at once (see sketch). But if one of the young is older or stronger to a marked degree, it will usually be fed first. The weaker young one will get little or no pigeon's milk, and although its crop may be full after each feed, it will be malnourished. It will be weakly and badly fret-marked if it survives at all, although it may improve after fledging if food supplies are good. For the same reason a brood of three is seldom, if ever, completely successful. These circumstances are not likely to occur in a wild, or even a feral state, although exceptionally they may do so. But it will often happen that an aviculturist may wish one pair of doves to rear other young without sacrificing their own. In such cases I have found that if the weak young ones are fed—additionally to the parental feeding—with egg custard, a few mealworms and a very little chewed up lean meat, they will soon start to thrive and thereafter progress normally.

Colour Varieties.

In this brief description of the colours most prevalent in Feral Pigeons, I use the usual name given by pigeon-keepers in Britain. Unfortunately, in some parts, and in America, different terms are used for some colours.

Blue.—The natural colour of the Rock-Pigeon. General plumage blue-grey, usually pale blue-grey on wings, and sometimes also on underparts. Two conspicuous black bars across the wing, and a broad black bar at end of tail. Rump usually white or pale grey, but often same grey as rest of plumage. Neck and upper breast iridescent green and purple. A very common colour among Feral and Homing Pigeons.

Blue Chequer.—As in blue, but the wing bars wider and the rest of the wing feathers with black markings (" chequering "), giving a spotted effect. In dark blue chequers only a small grey mark may be left on each feather, and the closed wing appears very dark. In such birds the grey of the rest of the plumage is also darker, and the black spotting may extend to rump and flanks. The commonest colour among Feral and Homing Pigeons in Britain.

Velvet.—As dark blue chequer, but wing-coverts entirely black. All the " blue " colours may show a chestnut or rusty tinge on the black portions of the plumage, and may show a good deal of minor variation in shade of grey, type of chequering, amount and colour of neck gloss, and so on.

Mealy.—As in blue, but ground colour silvery or creamy grey, neck and breast usually tinged brown and with green and purple gloss, often rich chestnut-brown, head may be brown or mealy white,

in contrast to brown neck. Two brown bars across the wing, no tail bar.

Red-chequers and *Reds* have the same colours as mealies, but pattern (except for absence of tail bar) as in Blue Chequers and

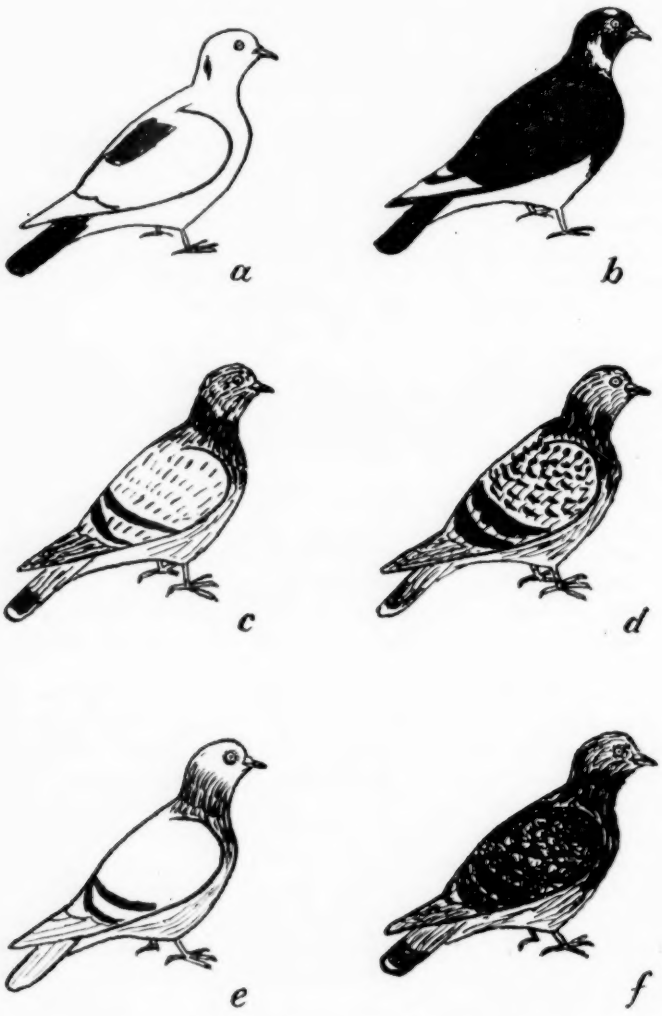

FIG. 5.—Some colour varieties. (*a*) Gay Pied ; (*b*) Black Pied ; (*c*) Blue ; (*d*) Light Blue Chequer ; (*e*) Mealy ; (*f*) Dark Blue Chequer. (For explanations see text.)

Velvets. The " Red " colours are usually rather infrequent in Feral Pigeons, except where these have been derived largely from Homing Pigeons, in which these colours are frequent.

Grizzle.—A pattern, difficult to describe, in which all the feathers are curiously streaked and intermixed with white. They vary from the " light print " which is predominantly white with dark-tipped primaries, and some dark feathers in its head and neck, through various shades of grizzled grey (with darker wing bars), and the same in the " red " colours. In juvenile plumage grizzles are usually much paler than they will be after moulting.

Black.—The deep solid black found in some fancy Pigeons is rare in feral birds. But specimens of a uniform slaty-black are not uncommon.

Pieds.—Any of the colours mentioned may be pied, that is, marked with white, the underparts, rump, primaries, and head being the parts most often affected. Such birds are common among Feral Pigeons in English towns. Gay-pieds—that is birds with more white than coloured plumage, are rarer. Pure white birds—other than first generation escapes—are most uncommon, although Gay-pieds coloured only on tail and scapulars are much less so.

Silvers.—A dilute form of blue, ground colour silvery cream, with grey-brown instead of black markings. Rather rare and, when they occur in feral population, almost always females.

Barless Mealies.—The term is sufficient description. Not uncommon (perhaps one in 2,000) in London.

Some other colours, such as mosaics occur very rarely (in feral populations). Most of the colour varieties described are subject to some variation. Thus blues may be " smoky ", a dull dark grey ground colour on wing coverts ; " silver blue ", of a bright pale, silvery hue ; " plummy " with pinkish eye-rims, a peculiar dulling of the plumage and much non-iridescent wine-red colour on the upper breast ; or " pencilled " with slight black marks along the vanes of the wing-coverts. But it would have taken up too much space to describe fully such minor variants of each colour phase.

Sexual Dimorphism and Juvenile Plumage.

In the Rock-Pigeon the visible sexual differences are slight, and the birds are difficult to sex accurately from their appearance. Generally the male has a slightly bolder head, and the iridescence on the neck is more intense and often more extensive. In Homing Pigeons and Feral Pigeons that approach them in type the male usually shows a larger cere (" wattle " of pigeon-fanciers) at the base of the bill, and his bill and head are altogether bolder and coarser-looking. But unless one knows one is dealing with related birds this is often of little value. Some strains of Homing Pigeons have much larger bills and wattles

than others, and a hen of such strain may be bigger and coarser than a cock of another.

Pigeons of any of the " red " colours (I am talking now of Feral and Homing Pigeons, not of fancy varieties specially bred for colour), generally show a difference in colour by which they can be at once correctly sexed if in adult plumage. Most males show small blue-grey or black marks—like little streaks or splashes of ink in appearance—on the webbing of the tail and wing quills. In the females these marks if present at all, are brownish in colour. All the sons of a " red " hen Pigeon are always reds (mealies, red-pieds, red grizzles, red chequers, etc.), unless they are albinos, no matter what colour male she is paired to.

Juvenile Pigeons are generally duller than the adults, and have only a very little iridescence on the neck feathers, which are not bifurcated like the adults'. If they are going to have rich purplish colour or wine colour on the upper breast, the feathers of these parts are tipped with rusty brown. The " reds " are browner and more gingery than they

FIG. 6.—Juvenile, blacked-in areas on wings show adult-type plumage. (See text.)

will be after moulting, the " blues " duller and often darker, the chequers have their wing markings less distinct. Grizzles are usually much paler and are often almost entirely white, it is surprising to see the near-white juvenile moult into quite a dark bird, as it often does. Young blues sometimes have the wing-coverts edged with dull whitish. Sometimes a juvenile will show beautifully laced blackish or reddish edges to the feathers of its wing-coverts. Such birds moult out, as a rule, into very ordinary and unattractive " blue-pencils " or " strawberry mealies " (a sort of clouded pattern between a light red chequer and a mealy).

The juvenile usually shows two areas on the wing (see sketch) where the feathers—before it commences to moult—show the adult colour and pattern. The feathers in these areas are indeed not exactly the colour they will be, or rather will be replaced by after moulting, but they are very close to it, and in the more deceptively-coloured juveniles they enable one to guess pretty accurately what the bird will in fact look like when adult.

The young birds have dark greyish—sometimes nearly black—legs and feet, and their eyes are also dull and greyish in colour at first. In young white (albino) Pigeons the feet are pale salmon colour, although adult albinos have the same purplish red feet as other colours.

Note.—The line sketches are intended merely to make the written descriptions more lucid. They have no pretension to art or a detailed accuracy.

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AN AVIARY POLICE FORCE

By DOROTHY A. JAKOBSSON (Ferndown, Dorset, England)

The best and least expensive way, in our opinion, for safeguarding one's birds from little wild creatures is to maintain a bodyguard of well-fed neuter cats. I stress well fed, as no weary, ill-nourished animal will delight in the sport of the chase. It may catch a stray mouse for food—if spry enough—and there the matter ends. My cats bring me in rats, stoats, weasels, mice, or young rabbits daily, and take no notice whatsoever of the doves when prowling around the aviaries. I am afraid they occasionally catch a wild bird, then what right have we to say them nay, who breed birds merely for food, or box hens in tiny cages that they may produce more eggs for our pleasure !

Lewes, Muezza, and Tangy Tim are real pets, and while always having access to the house and a cosy corner beside the fire in which to sleep, frequently toil out through rain or snow and bring home their catch in due season.

My aviaries are merely raised—on a foundation—a couple of bricks high, never once have I lost a bird through rats and the like. I must mention though that the actual sleeping quarters—where the doves are fed—are three feet up from the ground. All the aviaries are surrounded thickly with flowering shrubs, and the grass during flowering time is hay-high, giving perfect cover to any wild creature seeking such protection. Water also abounds in the vicinity—pools, a small stream, and boggy land near-by.

Perhaps it is not generally known that an old law—never repealed—still exists whereby anyone can be fined 5*s*. for not keeping a cat if a near-by householder can prove the vermin doing the damage came from the former's premises. Of course, in this age of high sounding phrases, the offence is termed " for not taking proper care in the destruction of obnoxious vermin ". In days agone, it was so judged that a person might not have the money with which to buy mouse traps, but a cat could always be kept, and as it could be maintained, in the main, from table scraps there was absolutely no excuse for not having one.

Is this the real reason, I wonder, why cats are still untaxed when almost everything else upon the earth is ?

* * *

SOME REFLECTIONS OF A SOFTBILL ENTHUSIAST

By Carl Naether (Sherman Oaks, California, U.S.A.)

For nearly twenty years I have kept quite a number of softbills year in and year out without interruption. So much effort, time, money, and above all, regard for the birds, have gone into this pastime that I should like to pass on a few of my reflections and reminiscences to other interested persons, in the hope that they may prove interesting as well as informative, and perhaps even helpful in some way.

Prior to moving into the beautiful San Fernando Valley in 1932, I had never kept softbills or, in fact, any kind of birds, except pigeons, which usually do not come under this classification. I well remember my modest beginnings : I started off with, of all creatures, foreign doves, getting a pair of Diamond Doves and other small varieties from the late Mr. Eighmey, of Costa Mesa, a dealer *and* a birdlover. Soon after, I obtained a variety of small finches, whose behaviour, however, seemed rather stereotyped to furnish continuous and lively interest for me over a period of years. Soon my attention was directed to singing softbills advertised in various domestic and foreign bird and pet journals. Then the fun—and also some work—began.

Happily do I recall my first softbill, a beautiful Shama Thrush,

supplied to me by the firm of Louis Ruhe in New York City. So eagerly did I look forward to this bird's arrival that I telephoned the railway express office half a dozen times in an attempt to ascertain its exact arrival either in Los Angeles or in Van Nuys. Finally, when word came that the bird had arrived in Van Nuys, a suburb of Sherman Oaks, I left my work in Los Angeles early and quickly in order to claim the precious bird shipment without further delay. When I got the shipping box home and opened it, the Shama hopped sprightly out of it and into the wire-cage I had readied for him, greeting me right then with a lovely little tune. This sort of greeting evidenced that the bird was in good health and apparently not at all fatigued from the four-day journey *en route* from New York to California. In those days no air-express service for birds was available. That first Shama proved to be one of the finest songsters it has been my pleasure and privilege to keep. But what pleased, even fascinated, me almost as much as his excellent singing was his cockiness and inclination to fight, his swiftness of flight in the room where he was kept (he was let out of the cage once a day for bathing and exercise), and his growing tameness and friendliness. All these attributes pointed to a bird possessed of over-flowing energy, charm, and " personality ". I shall always remember with delight the utter joyousness of the musical calls and whistles of that first Shama—in fact, I can hear them now as I type these lines. Alert from early morning until late evening, that handsome bird took notice of everything that went on within his view. Let a stranger approach, even at a distance, or a strange noise be heard, and the Shama would sound his sharp alarm note, whipping his long, beautiful tail all the while and scolding. Every day this bird would bathe in a large aluminium pan set outside his cage. He lived in apparent perfect health for three years, dying suddenly one forenoon of a stroke. Though greatly saddened by this Shama's passing, his unforgettable charm prompted me forthwith to try my luck with other softbills.

In the summer of 1933 there came a Clarino, or Solitaire—all the way from Brownsville, Texas, in a dirty little uncovered wire cage containing a few dried-up berries. In English and in German books I had read of the quite unusual, clarinet-like music made by this plain, brown-coloured bird, a specimen of which I had neither seen nor heard before. Acute was my disappointment when reluctantly I signed for the shipment at the express office, for the Clarino was in bad condition owing, no doubt, to lack of food and water. Head tucked in his wing-feathers, he was sitting listlessly in the bottom of the dirty cage as if resigned to an early demise. When I arrived home with the bird, I soon found that he was much too weak either to eat or to drink ; so in order to save him, if at all possible, I forced a few drops of lukewarm milk down his throat, repeating the process—a rather delicate one for a beginner like me—at numerous intervals. It was my first experience

with forcing a bird to drink, but it was effective, for the bird began slowly to take an interest in his surroundings, but still he would not touch the soft-food mixture I had prepared for him. So, having read that Clarinos are fond of flies, I got busy at once and caught flies, numbers of them, till it got too dark—and I was greatly encouraged by the bird's taking them at first gingerly, then eagerly. By evening the Solitaire's plumage was almost smooth, and he did not bury his head in his wing-feathers any longer. I felt I had won the battle—with, of course, the bird's co-operation. Next morning, I looked after the Solitaire the very first thing, finding him quite well and willing to take mealworms and other food. Day after day this luminous-eyed bird improved, and it was not a week before he began to sing his flute-like melody which somehow carried me back to the stillness of the High Sierras, where I had journeyed in my younger days and where Solitaires usually build their nests in the shadow of waterfalls. So utterly different from any other bird's song was the Solitaire's that I could hardly trust my ears, for I did not know that any bird was capable of making such exquisite music. Though not as active as the Shama, and certainly not as nervous, this Solitaire, being easily cared for, became tame quickly. He especially relished freshly caught flies and moths, but he would also take mealworms.

These two good songsters constituted the beginning of my softbill venture, which to date has brought me many, many joys and occasional disappointments. Twenty years ago I was pretty ignorant of such birds' food requirements, even though I had made it my business right from the beginning to purchase and consult English and German authorities' writings on this subject. It seemed that in Europe during the greater part of the year, live ant-eggs constituted the principal food of captive softbills. It was asserted that they were so complete and effective in nutritive values as to satisfy almost any softbill's requirements completely—no additional foods being needed. But here in America live ant-eggs were not available. Of course, I eagerly read advertisements concerning various softbill food mixtures, purchasing this and that mixture in order to determine its merits. Always it was maintained that the food was " complete "—meaning that the bird fed with it required no other food, except perhaps a few live mealworms once or twice a day. Soon, however, I learned that my softbills did not like the commercial Mockingbird food, that they ate but very little of it, and that their general condition was not noticeably improved by it. Moreover, the birds would sing but little or not at all on this monotonous diet—to me a sure sign that their daily food lacked something quite essential.

So gradually I began to experiment by adding certain items to the soft-food, such as moistening it thoroughly with freshly grated raw carrot or sweet apple, enriching it with finely chopped hard-boiled

egg, boiled beefheart, or dried ant-eggs, first soaked in warm milk. I learned also that tastes of softbills differ widely, and that at times it requires considerable time and patience to accustom any softbill to a food he has not eaten before. I had often read in various foreign books that milksop was relished by certain species of softbills. However, my birds would have none of it—until I placed pieces of cut-up mealworms atop the milksop, so that every time the bird reached for a piece of mealworm, he also got a good taste of the milksop. By and by I gave the milksop without any worms—and it was taken. It consisted of spongecake and some Pablum soaked in fresh, sweet milk, with some honey added. This mixture is a much-relished daily food of such birds as orioles, honeycreepers, flycatchers, and thrushes. I give it to them fresh once a day.

Though rather ignorant of many essential aspects of successful softbill keeping, I managed with the aid of good books to learn much about it. I soon found that Europe had a corner, so to speak, on dyed-in-the-wool softbill enthusiasts. All the worthwhile books on this subject were published in Europe. When it came to keeping in good health for long periods of time even the most delicate wrens, warblers, and flycatchers, English and German fanciers seemed to be the experts. They, so I read, had been at it for years and years. Their magazines and books were filled with fascinating, practical experience articles on softbill keeping and training, while ours in America were almost wholly devoted to information pertaining to hardbills. Moreover, I soon learned that most American bird-fanciers consider the keeping of softbills, whether in cages or in aviaries, as entailing far too much trouble in feeding and in cleaning. Moreover, they usually wish their hobbies to pay expenses. Since it is practically impossible to raise softbills in captivity in appreciable number and since the market for them is limited, most American birdmen and women much prefer to keep finches and parrotlike birds, which breed more or less freely in captivity and which can be sold readily to other fanciers or to dealers.

So, taking everything into consideration, the best I could do in caring for my softbills was to rely on the printed suggestions found in British and German books and papers. Avicultural Magazine, *Cage Birds*, and *Die Gefiederte Welt*—in those early years of my hobby—frequently brought articles on how best to care for certain, more or less delicate, softbills. Moreover, I obtained some sound help from several fellow fanciers in California, in particular Alex Isenberg and Eric Kinsey, both of whom maintain to this day quite extensive collections of softbills, the former specializing mainly in foreign, the latter mainly in domestic species. Both, however, live five hundred miles distant. Detailed letters describing the various and ingenious foods supplied captive domestic softbills, received from Eric Kinsey,

and a subsequent visit to his aviaries, proved quite enlightening, as did a visit also to Alex Isenberg's avian establishment.

It was inevitable that in the beginning of my softbill hobby I should make blunders, resulting largely from giving the wrong foods. Thus, a disastrous blunder I made was to feed a delicate, wren-like bird quite a number of mealworms on the advice of a Japanese bird-dealer in Los Angeles from whom I had purchased the lively creature. If I remember correctly, the bird was a Japanese Wren. At any rate, it was modestly coloured—brown all over, tiny, and very, very lively. A Japanese woman who was in the store at the time of my purchase, gave an imitation of the bird's call which, to the best of my recollection, was something like " Uguisu, Uguisu ! " Sorry to relate, the bird did not utter these—or any other—notes while he was in my possession, where he lived but three or four days. Had I cut the mealworms into small pieces or had I soaked them in warm water to soften the hard shells, this charming, vivacious wren might have been mine to enjoy and to care for a long time. It could not, of course, digest the hard-shelled worms. For days the loss of this rare little bird saddened me. Hard as I tried to obtain another specimen—they cost $15 which at that time was a good price—such was not to be had since but few had been imported from the Orient. The loss of this bird taught me an important lesson—carefully to adapt the kind and the texture of the food, be it in natural or in commercial form, to the needs of each individual bird. Different softbills have different tastes and these manifest themselves in a variety of preferred foods. It is up to their keeper to determine as best he can, what foods keep certain birds in sound condition year in and year out. If he is genuinely concerned about the welfare of his feathered charges—wants to see them healthy and happy day in and day out—he will constantly endeavour to find new items of food and new food combinations, trying them out very carefully and gradually so that his birds' digestive mechanisms may adjust themselves readily to them, and without any ill after-effects. In other words, the new food or foods are given *in addition* to the regular daily menu and the birds are left to try them out themselves. It was in this manner that I learned that most of my softbills like peanut butter very much. Now I keep jars of this nutritious item in every aviary the year round. Even my foreign doves take peanut butter with gusto. But Indian flycatchers, Yuhinas, and shrike, added recently to my little collection, have not touched the peanut butter as yet. They no doubt will in due course of time. I never thought that softbills such as, for instance, Golden-fronted Fruitsuckers would eat fresh lettuce. Nevertheless, such is the case with mine—as well as with other softbills. It must be quite tasty to these birds because they have been in my aviaries for many years, a number of them for fifteen years, and quite a few over ten years. Recently I " discovered " pecan-meal as

making an excellent addition to the softbill mixture. Finely ground, it is easily mixed with the other items. The birds eat it readily and apparently it does them good. Not long ago I read an advertisement offering *wingless* fruit flies (*drosophila*) to fish fanciers. I purchased several cultures of these small flies in glass bottles some weeks ago, and I have been feeding the flies daily to a pair of jaunty Yuhinas. They make a lot of " musical fuss " the moment I place a dish with fifty or more of the tiny flies in their cage and they eat them in a hurry. I am convinced that these flies would serve as an excellent live food also for wrens, sunbirds, and humming birds, even though the two last mentioned might prefer flies that can fly. But my Canyon Wren takes them avidly. Since these wingless flies, feeding on decaying fruit, multiply fast, they are easily and quickly raised in numbers. In all softbill feeding, it is self-evident that the more natural we can constitute the daily diet, the more conducive it is likely to be to the birds' health and general well-being. Live food being the most important item in most softbills' natural diet, I make it my business to take every spider, moth, butterfly, angleworm, beetle, etc., to my birds the moment I catch it—take it, mind you, with a sort of boyish triumph as if I were bringing them an unusual delicacy—and maybe I am ! Always I find certain birds requiring some extra attention, extra care, extra food. Softbills exude individuality. My business is to cater to this charming trait in every possible way. Years ago I learned that giving my birds extra attention pays large dividends—in improved health of the birds, in more and better singing, in greater tameness and friendliness. Over the years certain birds, such as a Solitaire, a fruitsucker, a Shama, and a wren, simply *expect* extra service from me. They fly to me the moment I approach their cage or enter their abode, begging for titbits, which usually they get. I try never to forget that my birds are my responsibility—my *very deserving* responsibility !

But to return briefly to one of my main topics—initial blunders. Another blunder, one that I made several times, caused me considerable chagrin. A fellow birdlover (?), calling at my aviaries, would persuade me to let him have this or that bird, which he wanted " oh, so terribly much ! " Twice I have given in to such pleas, only to be very much disappointed some weeks later by the report that this person, not finding the birds to his liking, disposed of them on short notice and without making any sincere effort to learn their good qualities and to fit them into his collection. In this connection my many years of keeping softbills have made me sensitive to the birds' feelings and reactions, perhaps too much so. Softbills' feelings, it seems to me, are very easily upset. Being captive, they must endure so much fear from man, so much cruelty—directly and indirectly.

Take the average softbill. First of all, it is trapped in its wild habitat, stuck in a small box or cage, shipped over long and noisy

distances, then caught again, only to be again transferred from cage to cage and aviary to aviary. Its whole life pattern is being changed by this process, changed suddenly, often ruthlessly. The bird has to change many of his habits to conform to his keeper's whims and wishes. It is in constant fear of being caught up, dashing against cage-bars or aviary wire in a mad attempt to escape the grasping hand or enveloping net. No wonder that many softbills (and hardbills, too) require months, if indeed not years, to recover from such maltreatment. Some of them never recover, shown partly by the fact that they simply will not sing or breed in captivity, not only because they are wholly out of their accustomed *milieu*, but because they are mentally and physically shocked. Other softbills regain, after a time, their ability to sing, provided they are given humane treatment and patient care.

When one considers the fear which captive birds are subjected to, especially when caught up and transported, one finds it difficult indeed to justify the hobby of keeping such live birds as softbills. Many birds simply die from the effects of fear—the strain is too much for their delicate constitutions. Assuredly, the hobby of keeping softbills is in most cases nothing more than just that—a hobby, a personal pastime. It has practically no so-called scientific aspects or values. To be sure, occasionally this or that, more or less rare, species of softbill is successfully raised in captivity, and a general account of its breeding is reported and published in the avian press. But in many instances this account is far too general, too superficial to disclose essential habits of either parent birds or youngsters, or both. A report of such habits to have even the semblance of scientific character and value, would have to be based on continuous, day-in and day-out, very thorough observation of certain birds' behaviour. But such thorough-going observations are foreign to most keepers of softbills since, apparently, their recording would entail too much concentrated effort and writing. If, then, a species of foreign softbill has been induced to breed in captivity, and does so successfully, by all means let its owner report this success—but as a personal achievement more or less, not as a scientific one. And let such report be written from the standpoint of the hobbyist so that other hobbyists may benefit from it. It is regrettable that so many keepers of softbills cannot or will not *communicate* their observations and experiences through the printed word to other like-minded men and women. Go through the issues of this magazine, for example, and count the number of articles devoted to softbill-keeping and you will find few of them, not because softbills are not kept by many people and often in considerable numbers, but because their owners are reluctant to report on their collections, often greatly underestimating the value of their observations and their experience.

I have kept softbills for nearly twenty years—and I keep them to-day

—for one principal reason—their ability to sing. So I more or less confine my hobby to obtaining male birds of singing species and try to induce them by means of good care to entertain and inspire me with their songs. To me it is a never-failing, joyous surprise to hear a recently acquired bird sing for the first time. Shama and Dhyal Thrushes have, on the whole, proved my finest songsters, followed by European Nightingales, White-Cheeked Jay-Thrushes (really whistlers) European Blackbirds, and many other species. Freshly imported softbills, if not frightened out of their wits by frequent and rough handling in transport, will sometimes sing soon after arrival in my aviaries. Some, however, will require a season or two of acclimatizing and adjusting to new surroundings and of freeing themselves, so to speak, from shock before they will sing at all. In captivity some softbills' ability to sing will improve from year to year. The exact reason for this condition I do not know, unless it be due to a more nutritious and eminently regular diet than that obtained by birds which are at liberty and on their own, and perhaps also to an increased feeling of " at-homeness ". Anyhow, I have learned that it pays to give a bird ample time—a year or more—in which to prove his singing ability. In certain instances he may need that much time to recover from the effects of fright induced by having been caught, boxed up, and shipped —to him thoroughly fearful and wholly unnatural experiences.

Whether to keep softbills in cages or in aviaries is assuredly a debatable matter. It depends largely, so it would seem to me, on the specific purpose for which the birds have been acquired and for which they are meant to be kept. If that purpose is to tame a softbill quickly and convert him into a pet or to observe his habits at close range over a period of time, then the cage is by all odds the proper enclosure for the bird. If, on the other hand, a softbill is to lend avian atmosphere to a piece of wired-in outdoors, or to breed, then the aviary is the proper place for him. Planted aviaries are best for most softbills since they afford them the most natural environment and protection in captivity. By nature shy, most softbills will hide in bush or shrub, especially when they see strange persons or animals approaching. Usually, therefore, an aviary is not as effective a means of showing off birds as is a cage. Even those birds which ordinarily are so tame as to take mealworms from their keeper's hand will, when sighting strangers, go into hiding. Here I recall the enterprising birdman who filled his spacious, partially planted aviaries with numerous softbills only to discover that, as a rule, they would stay out of sight, so that most of the time neither he nor members of his family, nor friends could see and enjoy his colourful collection. For a time he vowed " I'll cut out the shrubbery. I want to *see* my birds. I'll soon fix things ! " However, he soon found that among members of a large collection of softbills, such as he maintained for a time, frequent fights,

often resulting in serious injury to smaller or weaker birds, occur, unless the birds have close at hand a ready avenue of escape, such as the leafage of shrubs and trees planted in the aviary. When, more or less frequently, this same hobbyist found valuable birds dead on the floors of his aviaries, he became convinced of the birds' need for shelter, for hiding places, which he then supplied promptly. Since most softbills do not damage living plants, their aviaries may be thickly planted to suit their needs for protection and also their keeper's needs for attractive landscaping. Except for the birds, assuredly nothing gives to an aviary a more pleasing and a more natural setting than various living plants, deciduous as well as evergreens. They lend it that indispensable out-of-door atmosphere, which invites favourable attention from its owner and often favourable comments from his friends and visitors.

In conclusion, my keeping of softbills has afforded me hours upon hours of quiet relaxation. The work of caring for and feeding my birds has been—and is—pleasant and not time-consuming. Now, with between fifty and sixty softbills, largely in aviaries, the preparation of the various foods as well as the actual feeding requires only an hour or so—and a very pleasant hour it is, this fairly close association with my feathered friends which, given reasonably good and regular care, repay me handsomely in so many ways, not the least of which is their fine singing. By some persons the hobby of keeping softbills is considered expensive, but I have not found it so. What if I pay, say, fifty dollars for a Shama Thrush or a European Nightingale ! Assuming that I can maintain such a bird in sound health for at least ten years, the initial purchase price thus spread over the bird's life-span in my aviaries is quite reasonable. The major drawback to this hobby, in my opinion, is that it tends to keep its followers too much at home, for it is usually difficult to find a reliable man or woman, or one sufficiently interested, to care for one's softbills during a prolonged absence. Moreover, one is usually reluctant to entrust one's precious birds into the hands of a stranger for fear he or she might neglect them, since such neglect, whether intended or not, can easily prove fatal with more or less delicate birds accustomed to being given precise care.

All in all, I believe that softbills make remarkably interesting and intelligent subjects for a stimulating hobby, owing largely to their unique character. And they repay their keeper variously and generously for whatever attention and care he devotes to them day in and day out the whole year through.

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REPORT ON PROPAGATION OF HYBRID SONNERAT'S JUNGLE FOWL

By DAVID M. JOHNSON (Port Orchard, Washington State, U.S.A.)

Since my report of a year ago we have learned a considerable amount by trial and error in propagating our birds.

We find that new blood is a most important factor in producing chicks that are biologically proficient, with the will to hatch well and with constitutions for good stamina or low mortality. The question arises from time to time, why cross Grey Jungle Fowl with any fowl of another species regardless of what breed of that species it may be? The answer to that is that Grey Jungles or *sonnerati* are limited in number in this country and in need of new imported blood to rejuvenate them. *Sonnerati* are not too prolific in the first place, laying from four to seven eggs per clutch in a brief spring season, their autumn bloom after eclipse being too late in a northern latitude when the sun is rapidly leaving us, while hybrid birds and back crosses are so prolific, producing an abundance of eggs comparable to poultry.

Birds produced from hybrid cocks and *sonnerati* hens, which we may refer to here as ¾ Sonnerat's, all have the general appearance of pure *sonnerati* including the inherent wildness if not more wild.

We have learned that our best birds from all standpoints are those obtained from cock ¾ *sonnerati* ¼ Bankaiva crossed on Cornish Indian Game hens. These are the chicks so much in demand this season which we call "Johnsoni" 2.

They come as much alike as peas in a pod in uniformity of shape and colouring with all the qualities one would wish to obtain in a bird lovely to behold.

It is birds of this type we are exporting now to southern States and overseas, some 30 odd in number, which will be tried out in rehabilitation projects, habitats believed suitable to it as birds potentially for the coverts.

We believe there is much future for it as a wild bird as it retains all the wild and sharp-witted instincts of *sonnerati* and its distaste for captivity. Its powers and willingness for flight are all one could wish for, comparable to pheasant in flight.

We find that Cornish, or any of the true games, are the best medium for crossing as it makes a harmonious blend of no offshoots or mutations, no erect tails or surplus combs and wattles indicating the stigma of domestic degeneracy of most fowls.

It has been our hope that more aviculturists would experiment on the establishing of their own birds from original crosses so that we could exchange birds of different blood lines of no relation to one another

and who could introduce new Sonnerat's Grey Jungle Fowl blood to their flocks from time to time as the need shows itself.

A strain almost identical to pure *sonnerati* could be established with strong constitutions and a potential to abundance of egg production and prolific aptitude. Our ¾ cocks inherit the beautiful cape or hackle with the waxy dots as in *sonnerati* except the spots are slightly narrower.

Our experience in the rearing of chicks is that they do not thrive well in confinement and under artificial conditions. They are birds of energy, lovers of freedom, work hard for a living and seem to derive things from the earth essential to their welfare and good health. Free range or semi-enclosure seems to be essential, and they are more carnivorous and less granivorous than domestic fowl.

There has been no mortality from illness or disease in spite of our cold overcast sky and altogether reluctant summer to date.

Our parent birds are already going into eclipse for the season (July, 1954).

* * *

BAUDIN'S COCKATOO

(*Calyptorhynchus baudini*)

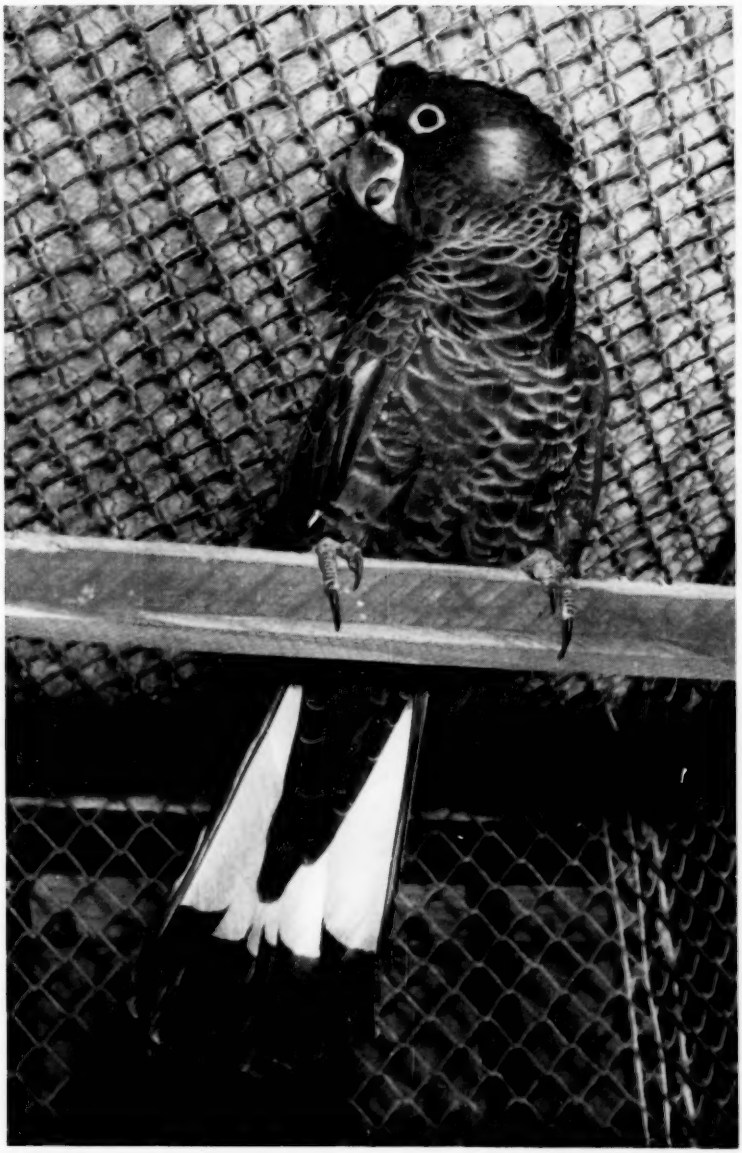
By JOHN YEALLAND (Zoological Society of London)

Baudin's, or the White-tailed Black Cockatoo, originally described and figured by Lear in 1832, is a native of forested areas of south-western Australia.

Gould says of it : " Like other members of the genus, it frequents the large forests of *Eucalypti* and the belts of *Banksiae*, upon the seeds of which it mainly subsists ; occasionally it seeks its food on the ground, when insects, fallen seeds, etc., are equally partaken of ; the larvae of moths and other insects are extracted by it from the trunks and limbs of such trees as are infested by them."

Mathews (*Birds of Australia*, vol. vi) quotes Tom Carter as having observed that : " This is the common Cockatoo of south-west Australia and is found as far north as the Murchison River. They associate in flocks when the breeding season is over . . . At times a flock will settle in an orchard, and do great damage in a very short time to the buds and young shoots of the trees . . . The breeding season about Broome Hill seemed to commence in August and continue until November. Two eggs appear to be the full clutch, and very frequently one egg is not hatched . . . The fledged young birds are fed by the parents for many weeks after leaving the nest ; thus on 10th February, 1914, I noted young birds being fed by adults . . ."

The nest is situated in a hollow tree, usually at a considerable height from the ground. At what age breeding commences is, so far as I am aware, not known.



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BAUDIN'S COCKATOO.

To face p. 224.]

Among other interesting observations on this bird, Sir Edward Hallstrom states (*Foreign Birds*, vol. 20, No. 4) : " The White-tailed Cockatoo has lately been declared a pest, as it has formed a habit of destroying apples in search of the pips."

Thus, it seems, yet another beautiful and interesting bird is threatened with extinction.

* * *

BREEDING OF COMMON RHEA IN ZOOLOGICAL GARDENS, ADELAIDE, AUSTRALIA.

By VINCENT D. HAGGARD (Director)

In 1938 Adelaide Zoological Gardens acquired a solitary hen Common Rhea (*Rhea rothschildi*), and it was not until thirteen years later that a mate was obtained for her. In the meantime she regularly produced eggs which, incidentally, proved excellent for culinary purposes such as omelettes and scrambled egg, these being not too strong in flavour as might have been expected.

Late in 1951 it was arranged with Taronga Park Zoo, Sydney, that we should have a male on loan for mating purposes. This bird arrived by air on 22nd November, 1951, and the two were placed together soon afterwards.

The first egg was laid on 5th December and others at irregular intervals, eight having been laid by 13th January. In the meantime three eggs had been broken by the birds and all were then removed from the yard as they appeared and held until the male showed signs of commencing incubation. In anticipation of this a nest had been hollowed out in the ground underneath a tree and an egg placed therein.

The male sat on this for a short time on 13th January and the other remaining four eggs were then placed under him. Subsequent to this the hen laid a further seven eggs, the male ultimately covering a total clutch of twelve. It followed, therefore, that he had been sitting a considerable time before the last egg was laid and that the first chick would make its appearance long before the last eggs were expected to hatch.

Incubation period is about forty days and the first chick appeared on schedule on 21st February. There was something abnormal about the arrival of this little stranger, as it was found early in the day at a considerable distance from the nest, together with the remains of the egg from which it emerged. This chick was placed in a box and kept in warm sunlight until later in the day when an attempt was made to place it under the brooding male. However, he gave it several vicious pecks and it was therefore placed in a warm brooder overnight. Next morning a second chick was found in circumstances

similar to the arrival of the first, and the two were placed in the brooder out in the sunlight which was nice and mild at the time. At this stage they were too young to be in need of food, but both showed an interest in shell-grit and swallowed a few pieces. Instinct was already prompting them to take in this necessary adjunct to assist in digestion of food.

Late in the second day three more chicks had hatched and the male was by then looking upon them with a more kindly eye ; the opportunity was therefore taken to return to him the first two arrivals. The score was now five. On the third day a sixth chick hatched and the proud father came off the nest the following day, leaving six unhatched eggs. This eventuality had been foreseen, owing to seven eggs being laid some days after incubation had commenced, and an incubator had been warmed up in advance in readiness to carry on with the job. Two of the eggs were obviously no good, but the other four were placed in the incubator although hopes were not high of getting more chicks. However, much to our delight, about a week later three more new arrivals appeared at odd intervals. These were kept in the brooder for several days till they gained strength, then being transferred to father's care. He accepted them readily enough but there was a very noticeable disparity in their size compared with their elder brethren, this difference persisting for several months when it became more difficult to differentiate between them.

At no stage after the eggs were laid did the hen evince any interest in the proceedings and, after the arrival of the chicks, it was deemed advisable to remove her from the yard as her attentions were inclined to be hostile rather than maternal. Early every evening and when the weather was cool, father would sit down and fluff out his wings and the chicks would snuggle underneath just as domestic poultry chicks do. He proved a good parent and not one chick was lost.

When about four months old, five chicks were sent by air to Taronga Park Zoo, one in exchange for " father " who was retained and four as Taronga's share of the " dividend " resulting from the satisfactory arrangement entered into earlier.

Summary.

5.12.51	First egg laid.	
14.1.52	Male commenced incubation.	
21.2.52	First chick hatched	by male.
22.2.52	Four chicks hatched	
23.2.52	One chick hatched	
1.3.52	Two chicks hatched	by incubator.
2.3.52	One chick hatched	

In subsequent seasons we have bred numerous Rhea chicks and, in fact, at the time of writing the male is " busy " incubating another clutch of eggs.

It might be thought that undue importance was attached to the breeding of this species which has since proved very easy to rear. It is pointed out, however, that Australian Zoological Gardens are subject to very restrictive quarantine regulations, and several years prior to the first breeding referred to, a complete ban was placed on the importation of all birds from anywhere in the world except New Zealand, where quarantine regulations are equally restrictive. The reader will readily understand, therefore, the importance that Australian Zoological Gardens place on the breeding of foreign birds which, unfortunately, can no longer be imported. Unless we can breed from the stock of exotic birds in our possession the species gradually becomes extinct in our Zoological Gardens as individuals die out.

We hopefully look forward to the day when perhaps the severe restrictions might be somewhat ameliorated, but in the meantime must do the best we can in the circumstances. We envy Zoological Gardens in other parts of the world which operate under much more liberal quarantine regulations and which, with certain reservations, can make a choice from the birds of the world.

* * *

BREEDING THE CANARY-WINGED PARRAKEET

(*Brotogeris versicolurus chiriri*)

By E. N. T. Vane (Ballinger, Bucks, England)

Records of the breeding of *Brotogeris* parrakeets are few, probably because they are such delightfully finger-tame pets that the opportunity to reproduce is seldom given them. Peters lists three subspecies of *versicolurus*, regarding the Canary-wing as only subspecifically different from the Whitewing, yet the All-green he considers as a different species. When the Parrot ban was raised recently a number of Canary-wings came over and among the consignments it was not unusual to find an occasional odd specimen of either of the above-mentioned birds.

Some specimens appear to be considerably larger than others, but as all the birds in each consignment are generally of the same size, this feature is possibly only due to a local race variation. The distribution is rather wide, ranging from Eastern Bolivia to Argentine, Eastern Brazil, and Paraguay.

In setting out to breed them, the first obstacle is to sex them correctly. There is no external sexual distinction ; South American parrakeets are very difficult to sex by the pelvic bone test, as these are much more close set and elongated than African or Australian birds, but when in breeding condition there is a noticeable variation in the opening in the sexes. This definitely disappears when breeding is over and it was quite impossible to tell my breeding pair when they were eventually brought

in, although I knew perfectly well which was which as the male had a slightly upturned toenail on one foot. They had been in my possession over a year before all doubts on this point were removed. According to some old writers the hen has a less deeply notched and narrower bill and her head is rounder and smaller than the cock's. If anything, my hen is larger than her mate, but they are practically indistinguishable. Her bill is less notched on one side than the other, in other words it is impossible to sex them by sight.

For the first year they were kept in a cage indoors as they were pinioned and unable to fly at all. They were absolutely fearless of human beings and appeared fully conscious of their superiority. They chattered incessantly and made a great noise when certain programmes were on the radio or one attempted to speak on the telephone. When they were fed they always came down to wait for the fresh food and used to bite my fingers impatiently ; it would have been perfectly easy to tame them to sit on one's finger, but I always hoped to breed them so did not encourage them to become over-familiar.

During the winter of 1953–4 they moulted out and grew their flight feathers, the cock being the first to do so. It now became possible to distinguish their sex as the cock sometimes fed the hen and it was then noted that he had one upturned toenail. At the end of April they were moved to a small aviary facing south, 6 feet long, 6 feet high, and 3 feet wide, with half of the roof covered in and the whole of the back protected on the north with asbestos sheet. There was no completely enclosed shelter, but 2 feet from the rear a sheet of windowlite afforded protection from wind and rain, and behind this screen their food was supplied through a service door. A large, solid nest-box about 18 inches deep and 9 inches square, with 3 inches of peat mould in the bottom, was fixed to the rear of the flight. To start with they did not use the box for roosting, but were sensible enough to get right at the rear high up under cover, which was just as well as mid-winter returned early in May and they had to be brought in once more. When roosting they like to hang upside down on the wires both in cage and aviary. A second attempt was started on the 8th May, and by the 21st they began to roost in the box, and a week later the cock was feeding the hen regularly.

Their demeanour in the flight did not change, they were still perfectly fearless and friendly though when they came nibbling at my fingers the cock began to scold rather badly and sometimes bit rather hard. It was plain that with the approach of breeding operations he was going to be somewhat vicious and it would be unwise to associate more than one pair in a flight at this time. They made much less noise in the aviary, only chattering when they saw anyone coming round to see them. They ignored some lovebirds in an adjoining flight unless they hung on the wire, but as this was double and spaced

one inch apart no harm could result, though without this precaution I fear there would have been many toes missing by the end of the season.

On the 10th June they were seen mating. This was accomplished standing side by side on the perch gripping their left and right feet together as if they were " hand-in-hand ". The box being hung outside the flight I was able to inspect it without their having any idea that I was doing so. As soon as their food was supplied in the morning they were so busy examining it and scolding me through the service door that I could safely look in. The box was perfectly clean, a certain amount of whittling had been done and a hollow made in the peat mould in one corner. No materials were taken in.

The first egg was laid on 11th June. There were two on the 13th, and the hen began to spend more time in the box. On the 20th she was off feeding and there were five eggs a little larger than a Budgerigar's and more elongated. She had been almost continually in the box since the 13th, and I assumed she had been sitting from the second egg and they would probably hatch about 1st July, though the eggs appeared so light in colour that I hardly expected them to be fertile.

This fear mounted when I was next able to inspect the nest on 1st July. Still five eggs and not very fertile-looking. The box was right next to the feeding trap and the hen sat close every morning until I had moved two or three flights away, when she immediately came off and started feeding ravenously. I did not wish to disturb her unnecessarily so did not go back and interfere.

On the 11th July I looked once more and was very disappointed to find still five eggs which did not look particularly " heavy ". I decided in desperation to give them three more days. On the 14th, when I went to remove them two looked as though they had something inside, so I left them and was most thankful the next morning I had done so as three eggs had hatched on the 15th within the twenty-four hours. On the 16th all five had hatched. The period of incubation is, therefore, a lengthy one of about twenty-six days at least. The young were entirely naked, just like Budgerigars, which might, therefore, be used as fosters if the long incubation period is allowed for by moving the eggs. They were slow in developing, being completely naked until ten days old. On the 30th (fifteen days) the feather tracts could be seen forming, there was no down, their eyes were black and still unopened, the beaks were white—not black as I once saw them described.

Their eyes were really open on 8th August (twenty-four days old) by which time the feathers were opening and showing yellow and green. By the 18th their bills were horn colour like the adults, and they were looking extremely well—one had disappeared in the early days. All

the eggs had hatched, but they were never interfered with beyond the unsuspected inspections from the back, all that one could see was a tangled bunch of young birds and possibly the last to hatch did not get its fair share and was lost.

The hen did all the incubating, the cock joining her at night in the box when he may have assisted in these duties, but she only came off at short regular intervals to feed and exercise. Both birds remained perfectly fearless and literally finger tame, yet aggressive and a little vicious, especially the cock, who was a model parent, spending the whole day preparing the family meals; he scarcely left the food bowl which was filled twice daily. Enormous amounts of greenfood were consumed.

The first young one to leave the nest made the effort on 3rd September, just eight weeks from the date of hatching. It was exactly like its parents but a little smaller and the bill was obviously immature. It stayed out all day, but as it was cold in the evening he was put back into the nest at nightfall. Two came out on the 5th and again were replaced at night. On the 6th all four fledged and made a very pleasant sight on the perch together in a row with mother and father on the outsides. One was rather less steady on the wing than the others. On 8th September they all stayed out as I neglected them by attending the B.A.C. dinner, but the night was fine and they appeared none the worse.

On the 9th it rained and rained, just like an English summer, and I was very sad to find the youngest one lying on its back with its feet in the air in a pool of water an inch deep. I picked him up and was about to throw his body away when I discovered he still had a spark of life left. I brought him in and held him in front of an electric fire fully convinced that I was wasting my time, but in an astonishingly short time he recovered and within two hours he was sitting on my finger quite dry and preening himself. To cut a long story short, he was hand-reared and was feeding himself in ten days. He was given soaked bread rusks with a little oatmeal and peanut butter and Virol. He also had a little apple, a daily dose of abidec, and in a few weeks he had caught up his brothers, with whom he is now reunited although he is much steadier than they.

The other young stayed out in the aviary until the end of October. They did not go back into the nest to roost, but sat side by side on a perch, the parents hanging from the wire overhead. On one occasion the temperature dropped to 25 degrees before they were brought in.

Their food is mainly canary (mazagan), with a quarter part of white millet, one-eighth part sunflower, a few oats, and a small ration of hemp whilst being reared. They are very fond of fruit and had a slice of apple or pear daily each, occasionally a piece of banana as I understand that most South American Indians feed them on this

almost exclusively. They did not care for millet sprays much. Every day they had moistened brown bread rusks and sprouted canary seed. They consume a large quantity of greenfood, starting in the early part of the season on dandelion leaves, then their seeding heads, groundsel, chickweed, sow thistle, and later on all seeding weeds. They delighted in chewing up a huge whole sow-thistle.

Given a true pair and the right accommodation, which is very modest, I believe there is every hope that these delightful little birds would establish themselves in our aviaries, but I do think that each breeding pair requires separate quarters.

* * *

As described above, E. N. T. Vane has bred the Canary-winged Parrakeet (*Brotogeris versicolurus chiriri*). It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

COUNCIL MEETING

A Council Meeting was held on 10th November, 1954, in the Council Room, Zoological Society of London.

Officers for 1955

There were the following retirements and appointments :—

Council : Mr. G. T. Iles, Mr. R. C. Witting, and Mrs. G. T. Clark retired by seniority.

Mr. F. Grant, The Rev. J. R. Lowe, and Mr. E. N. T. Vane were elected to fill the vacancies.

Elected Hon. Life Member : Mr. W. Bamford.

Society's Medal

The Society's Medal was awarded to : Mr. D. Goodwin, for breeding the Lanceolated Jay (*Garrulus lanceolatus*).

Arthur A. Prestwich,
Hon. Secretary.

DARENTH-HULME, 1954

By KAY BONNER (Southgate, England)

The past breeding season has been very poor, in fact it is really remarkable how few young ones have been reared. It is fortunate therefore that, in spite of the atrocious weather, even including the near arctic conditions early in the year, the mortality has, for a comparatively large collection, been extraordinarily low.

It will perhaps be easiest to list the various aviaries and their inmates. The main range has housed the following :—

1. Stanley Parrakeets, a well-tried breeding pair produced only one good young one. Diamond Doves.
2. Queen Alexandra's Parrakeets laid, but did not hatch.
3. Stanley Parrakeets, and two cock Yellow-naped Whydahs.
4. Cockatiels produced one very undersized young one that died soon after leaving the nest. Fischer's Lovebirds, a small colony that just holds its own. One young one was hatched and reared by a pair of Budgerigars. A cock Peach-faced Lovebird.
5. Lineolated Parrakeets, the breeding colony has increased but to what extent is not known exactly.
6. Pennant's Parrakeets, the pair that reared four good ones last year, reared only two this season.
7. Abyssinian Lovebirds, the three pairs again failed to reproduce.
8. Golden-winged Parrakeets, the two pairs made no attempt to nest, not even inspecting nest-boxes.
9. Moustache Parrakeets, most dreadfully noisy and definitely not recommended to any aviculturist likely to suffer from neighbour trouble.
10. Cactus Conures and a single Weddell's Conure. Painted Quail.
11. Two pairs of Yellow-cheeked Conures, both nested unsuccessfully : another pair died during the arctic weather, feet badly frost-bitten.
12. Two pairs of Canary-winged Parrakeets occupied this aviary early in the season. This species has the reputation of being *very* quarrelsome, and this was confirmed by the fact that one of the quartet was severely maltreated and rescued only just in time to save its life.
13. Golden-mantled Rosellas reared one only.
14. Black-headed Conures reared one good young one. Cock Delamere's Whydah, a really handsome bird.
15. Barraband's Parrakeets, the cock went down with paralysed legs

early on, as a consequence the eggs were infertile ; he has now nearly recovered.

16. Crimson-winged Parrakeets.

17. Eight Red-bellied Conures occupied this aviary until one died early in the spring. As no attempts have been made to nest, we are wondering whether it might perhaps have been our breeding hen.

18. Eight Yellow-cheeked Conures at the beginning of the season ; one has died since. No breeding attempts, nest-boxes not even inspected.

The 7 ft. 6 in. wide flight stretching along the front of the main aviaries was stocked this year with two dozen Budgerigars of assorted colours ; and the breeding here has been very satisfactory indeed. The 72 ft. flight has enabled the young to develop into really fine, robust birds—very different to some of the control-bred, bird-room birds seen nowadays. For want of other accommodation two Jobi Island or White-breasted Ground Pigeons (*Gallicolumba jobiensis*) were put in this flight. Fortunately they proved to be a pair, and built a very slight nest, mainly of old millet sprays, precariously constructed on the top of a Budgerigar nest-box hanging under shelter in a corner of the flight. Not only did they hatch a young one, but they succeeded in rearing it in spite of the Budgerigars. At one time we were troubled by daily visits from a Sparrow-Hawk. On these occasions the Budgerigars panicked, and it was not uncommon to find a dozen or fifteen taking refuge with the pigeons on top of the nest-box. This young one is probably the first reared since Herbert Bright's first success when he reared two young ones in 1922.

The 10 ft. wide service passage and wilderness aviary at the rear of the aviaries contains two pairs of Crested Bronze-winged Pigeons, four Purple-headed Glossy Starlings, and a hen Amherst Pheasant. The cock bird was allowed to escape and, as it stayed in the district for a week or more, the daily papers were able to carry reports of a mystery bird seen in North London, with the usual, totally incorrect statement that " Zoo experts are puzzled " !

The large aviary containing the Red-faced Lovebird colony of twenty-eight remains just a colony. There has been considerable activity and much excavation, but as far as we know at present there has not been a single egg. There are also Chinese Painted Quail and breeding Diamond Doves.

The nine outside pens hold a miscellaneous assortment of Golden and Silver Pheasants, domestic Pigeons, Bantams, Java and Barbary Doves, Bronze-winged and Triangular-spotted Pigeons, and, most important, three Pied Imperial Fruit Pigeons. The latter, commonly known as Nutmeg Pigeons, are in perfect plumage, the white parts

being spotless, snowy white, so very different to the dull, cream-coloured birds sometimes seen in zoos. There is also a very tame Carrion Crow.

The White-bellied Caiques continue to occupy their own especial aviary. Although they pair frequently they never go further towards nesting than to sit on top of their nest-box.

Bird-room No. 1, at present houses a pair of Noble Macaws, three Canary-winged, one White-winged, one All-green, and eight Lineolated Parrakeets; one Rosella; two Senegal Parrots; two pairs of Emerald-spotted and two pairs of Blue-spotted Wood Doves, and three Peaceful Doves.

A second chalet-type bird-room has recently been completed, and now has as tenants a pair of Blue-crowned Conures, a Black-headed Caique, and four Bleeding-heart Pigeons.

The house Parrots still consist of a pair of Greys, three Senegals, a Brown-headed, and a Meyer's—originally believed to be Rüppell's.

Finally, at the London Zoological Gardens, we have three Nicobar Pigeons and five Green Imperial Fruit Pigeons which John Yealland is kindly keeping for us until next spring.

* * *

RECENT BREEDING RESULTS

By ALAN LENDON (Adelaide, S. Australia)

This article records the results achieved in my collection from the time of publication of my articles in the AVICULTURAL MAGAZINE (Vols. 55 and 56, 1949–50), until my cessation of avicultural activities after the 1952 breeding season.

Barraband's Parrakeet (*Polytelis swainsonii*).—The three young in the nest at the time of writing (November, 1948) were successfully reared, leaving the nest early in December. The same pair of birds reared five young in November, 1949, and the same number again in November, 1950. In 1951 the old cock died just as the clutch was hatching, but the hen successfully reared all four young single-handed, and they were perfect specimens when they left the nest in November.

For the 1952 season the same hen, one of my own breeding in 1946, was mated to a young wild-caught cock. He proved to be possessed of the nature of a Crimson-wing, and drove her mercilessly long before she was ready to nest, but she eventually hatched four young and reared three.

Rock Pebbler Parrakeet (*P. anthopeplus*).—The hen that successfully reared six young in 1948, died in September, 1949, and her mate died in September, 1950, just after a newly obtained hen had started

laying. This hen did not seem at all attractive to male Rock Pebblers, as in 1951 she could not persuade either of two mates to feed her, and she laid two eggs, but did not incubate.

In 1952, although a fourth male, who had been most attentive when mated to a hen King, fed her occasionally, she laid three eggs, but again did not incubate.

Queen Alexandra's Parrakeet (*P. alexandrae*).—Three of the four young previously referred to were satisfactorily reared in January, 1949. In the 1949 season four young were reared in November from the first nest. Of the second clutch only one egg was fertile, but this was hatched and reared. In 1950 four young were reared from the first nest, but a second clutch was deserted. In 1951 three were hatched, and two reared from the first clutch, and two hatched and reared from a very large second clutch.

The old hen failed to moult satisfactorily before the 1952 season, and her first clutch of five were all infertile ; she died after laying four more eggs. A second pair kept that year laid a clutch of six late in October ; four proved fertile, three hatched, and two left the nest late in December, being very poor, undersized specimens.

King Parrakeet (*Aprosmictus scapularis*).—In 1949 the old pair did absolutely nothing, although the hen had raised my hopes by laying from the perch the previous season. For the 1950 season I changed the hen, but she got no further than visiting the log occasionally.

In 1951 I was fortunate to obtain the pair of birds that had bred regularly for Mr. H. Bradley, but the hen did nothing beyond lay two eggs on the ground in mid-November. In 1952, although I obtained their original massive log, they did not even lay, and a second pair did likewise.

Crimson-winged Parrakeet (*A. erythropterus*).—A new pair obtained in 1949 did nothing and began their moult in the first week of December. In 1950 this pair came into breeding condition in mid-September. The first egg of a clutch of three was laid in mid-October ; all were fertile and had hatched in the first week of November, and although two died quite early, the survivor was reared and left the nest in the middle of December.

In 1951 the same pair had a clutch of four eggs early in November, and all had hatched by the end of the month ; of these, three were reared, leaving the nest about the New Year. All three young, in addition to their father, died within a month !

For the 1952 season the same hen was mated to a new adult cock, and an egg was found on the ground in the middle of November ; although this was placed in the log, three further eggs were not laid until the end of the same month. Of these all three were hatched and reared, the young birds leaving the nest towards the end of January, 1953.

Pileated Parrakeet (*Purpureicephalus spurius*).—In 1949, a clutch of seven was commenced on the last day of September, six were fertile, five were hatched, and four reared, leaving the nest in early December. In 1950, for some unexplained reason, no eggs were laid, but in 1951, although the first egg was laid from the perch in mid-October, six more were suitably placed and all were fertile and had hatched by mid-November. Of these five survived to leave the nest about Christmas time, but the smallest only lived a few days.

In 1952 the clutch of six was not commenced until the end of October, four out of six were hatched, and three left the nest late in December.

Crimson Rosella (*Platycercus elegans*).—This species was not represented in my collection in either 1949 or 1950, and a pair obtained before the 1951 season did nothing, as did another pair in 1952.

Adelaide Rosella (*P. adelaidæ*).—The pair that I had had for several years laid a clutch of six in the middle of September, 1949 ; four of these were fertile, but they were deserted when about due to hatch, and disappeared a couple of days later. A second clutch of four was laid early in November, and three dead young were found late that month. In 1950 the same pair had four eggs by the end of September, but had broken them a few days later, and several more eggs were subsequently laid and broken.

For the 1951 season I obtained a new hen, and she completed a clutch of six eggs, all of which were fertile, by 25th October. Three newly hatched young were observed on 17th November, and four days later there were three young living and one was dead ; the two remaining eggs were given to a sitting pair of Western Rosellas, who hatched them, but allowed them to die. The three young Adelaides flourished and the first, a cock, left the nest on 20th December, and the other two, a pair, two days later. This constituted my first success with this species.

In 1952 the hen started to lay early in September, but the eggs were broken almost as soon as they appeared. I thereupon removed the log for a few weeks, and on replacing it, the next egg was laid about the middle of October, and promptly broken ; five more followed and were incubated, but only one was fertile, so two Golden-mantled eggs were substituted for the clear ones. The young Adelaide hatched first and the two Golden-mantleds about a week later ; the Adelaide died nearly a month after hatching, and the smaller Golden-mantled a week later, the other left the nest prematurely next day, and was obviously being neglected, so was given to a pair of Pale-headed Rosellas who were successful in rearing it.

Yellow Rosella (*P. flaveolus*).—The pair which reared two clutches in the previous season commenced a clutch of six eggs in the middle of October, 1949. These were all fertile and young were seen early in

November, and four were later counted ; these were all reared and left the nest between 11th and 22nd of December.

In 1950 a clutch of six was started early in October, five were fertile, and young were seen by the end of the month ; all of these were reared, and left the nest early in December.

In 1951 the clutch of five was started a little later in October, and all were hatched ; four were reared in early December, but one must have injured a wing, as it was never able to fly. The following year six fertile eggs were produced towards the end of October ; five were hatched and left the nest from mid-December onwards.

Green Rosella (*P. caledonicus*).—No results were obtained in either 1949 or 1950, but in 1951 the hen of the previous season was given a new mate, and she laid the first egg of a clutch of six on 3rd November. All proved fertile, and the first had hatched by 1st December, and four could be counted two days later. One of these died quite early, and two left the nest prematurely on 27th December, an extremely hot day, and were replaced. The first young bird did not leave finally until 8th January, and the other two followed two days later. All were successfully reared ; they were a cock and two hens, and this was my initial success with this infrequently bred species.

In 1952 the same pair laid a clutch of seven fertile eggs at exactly the same time of the year, all hatched and five survived, leaving the nest in mid-January.

Pale-headed Rosella (*P. adscitus*).—The pair which had reared two young the previous year, started the 1949 season with an infertile clutch, and only reared one out of three hatched in the second nest.

The following year the same hen, with a new mate, did not even lay. In 1951 I acquired a new pair which had been regular breeders for several years. They laid their first clutch of six late in August, hatched the lot, and reared five of them. The second round of five was laid in the middle of November, and were all reared by early January. Carrying on in 1952, the same pair reared four out of five hatched from their August clutch, and only one out of the two hatched from the November clutch, in addition to the Golden-mantled previously mentioned.

Northern Rosella (*P. venustus*).—In 1949 the pair that had been mated up the year before started with an infertile clutch in July, and followed with four more eggs in September, all of which were hatched and reared. This was the precursor of three remarkably successful seasons, for in 1950 they reared five young from the first clutch laid early in July, and five more from the end-of-September clutch. 1951 saw a very similar result, four being obtained from a clutch laid late in June and four more from a mid-September laying. For 1952 the results were three from the early clutch and a further four

from the later one ; thus the total works out at twenty-nine hatched and all reared from seven clutches in four seasons.

Eastern Rosella (*P. eximius*).—In 1949 the hen that had been successful in the previous year was mated to one of her sons. She laid a clutch of five eggs towards the end of October and incubated steadily, but all proved infertile. In August of the following year the son, having fallen in love with a Golden-mantled hen in a near-by aviary, proceeded to commit matricide, since when the common race has not been kept.

Golden-mantled Rosella (*P. splendidus*).—The cock which had bred in 1948 was mated to one of his daughters the following season, and although she laid three eggs in November, she did not incubate. In 1950 she was given an unrelated mate, and she started to lay early in October. Although most of the early eggs were broken, I removed eleven from the nest early in November ! Undeterred, she recommenced laying late in the month, and when I removed seven eggs at the end of December I was amazed to find one contained a chick on the point of hatching !

In 1951 the same pair had a clutch of six, laid late in September, of which three were hatched and reared. In 1952 bad habits were again in evidence, for many of the early eggs were broken, ten were removed in November, and two of these were hatched by Adelaides and one eventually reared with the help of the Pale-headeds.

Western Rosella (*P. icterotis*).—No results were obtained either in 1949 or 1950 from the pair which had laid and hatched young in 1948. A new hen was obtained for 1951, and although she laid a clutch of five early in November, all the eggs were broken. She was given a new mate for 1952 and laid a clutch of six in mid-October ; three were fertile, but only one was hatched, and it promptly died. Three more infertile eggs were laid in November, and another two in December, which were not incubated. A second pair of immature birds laid five eggs early in November of that year, but did not incubate.

Red-rumped Parrakeet (*Psephotus hæmatonotus*).—This species was not kept in either 1949 or 1950. A pair obtained in 1951 had an infertile clutch of six early, then started non-stop laying early in October, and had a clutch of four in December, three of which were found to be fertile when deserted. In 1952 a different pair did nothing.

Many-coloured Parrakeet (*Ps. varius*).—Not kept in 1949 or in 1950. In 1951 a wild-caught hen mated to an aviary-bred cock did nothing, and a different pair obtained in 1952 were no improvement.

Red-vented Blue Bonnet Parrakeet (*Ps. hæmatorrhous*).—The old male did nothing with either of the mates provided in 1949 and 1950. A pair of young birds bred in my collection during the war were bought back, but they did nothing in either 1950 or in 1951, and both died in May, 1952.

Yellow-vented Blue Bonnet Parrakeet (*Ps. xanthorrhous*).—The old breeding cock was given a tame hand-reared hen as a mate in 1949, and she laid a clutch of six towards the end of August. Five were fertile and three were hatched and reared, leaving the nest at the end of October. In 1950 the same pair hatched three and reared two at the same time of the year, and in 1951 four were hatched and reared, again at exactly the same time. In 1952 the old cock failed to induce a new mate to lay, even though she spent some time in the log in November.

Little Blue Bonnet Parrakeet (*Ps. narethæ*).—The old breeding hen, with a new mate, had five clear eggs early in September, 1949. In 1950 the same pair had six eggs late in September ; only one was fertile, but it was hatched and reared. In 1951 three were fertile out of four laid early in September, and two hatched and were reared. In 1952 a new hen was obtained, but she did not lay, although the cock seemed more vigorous than in previous seasons.

Hooded Parrakeet (*Psephotellus dissimilis*).—No results were obtained, although three different pairs were tried during the four years.

Bourke Grass Parrakeet (*Neophema bourki*).—In 1950 the first pair was the old cock with a new mate. They hatched and reared four in the first clutch, but only reared three out of five hatched in the second try. A second pair reared only three out of six hatched in their first attempt, then laid eleven eggs without incubating, and finally only reared two of six hatched at the third try. In 1951 the first pair only brought off two out of five hatched the first time, but reared all four that hatched in the second attempt. The second pair laid ten eggs, of which I left them seven, all of which they hatched and five of which they reared. The hen then laid a further ten eggs, of which I left her six, all of which hatched, but only three survived. In 1952 the results were not as good. The first pair started by hatching five and letting them all die, and followed with two hatched and reared. The other pair also let die all five that they hatched in the first nest, but reared four from eight hatched at the second attempt.

Blue-winged Grass Parrakeet (*N. chrysostoma*).—In 1950 the hen of the pair that had hatched young in the previous season broke a wing and did not lay. The other hen ran true to form, and again laid a number of eggs without incubating. In 1951 the profuse egg-layer was mated to the by then bereaved husband of the broken-winged hen ; her first clutch of seven were laid in October, which is unusually early for this species, but all proved clear. Five out of a second lot of seven were fertile, only three hatched, and all died quite soon. The other cock of the previous year was given a new mate, and she had four hatched from five fertile eggs, but only succeeded in rearing two of them in mid-January. In 1952 this pair hatched all of four fertile eggs laid early in November, and had reared three by mid-December.

Elegant Grass Parrakeet (*N. elegans*).—The old breeding pair raised three out of three and one out of four hatched in 1950. In 1951 the first clutch was clear, only one was fertile in the second, and it was reared, and four Bourke eggs were substituted for an infertile third clutch, and two of four hatched were reared. For 1952 a new cock was obtained, and though the first clutch was again clear, two were reared from three hatched in a second try.

Rock Grass Parrakeet (*N. petrophila*).—In 1950 the old hen had a new mate, and she laid three eggs in October, hatched two of them, but allowed them to die when a fortnight old. The same pair had two clear eggs in 1951, and a new pair in 1952 did not lay, although the hen was in the log a great deal.

Orange-bellied Grass Parrakeet (*N. chrysogastra*).—In 1950 the hen became interested in the log early in December, and laid her first egg on the 30th of that month. The clutch consisted of four, which she incubated steadily, but unfortunately all were clear. Early in 1951 Sir Edward Hallstrom was kind enough to let me have a new cock to replace the old one, known to have been in captivity since 1938 ! This year the hen was seen in the nest, and feeding was observed late in December. On 4th January the cock was dead, and three days later the hen laid an egg ! However, she did not incubate, but produced another egg early in February. Early in 1952 I was lucky enough to obtain yet another cock, the best specimen that I have ever possessed, but unfortunately the hen died in September. The only pair that I know of in captivity nowadays is at the Adelaide Zoo, and though the hen lays and incubates most years the eggs have always been clear.

Turquoise Grass Parrakeet (*N. pulchella*).—In 1950 one pair did not lay ; the other pair did not sit on the first clutch, and reared the only one hatched in the second. The following year this latter pair again did not sit on the first clutch, the second were all clear, and the third again were not incubated. A new hen provided for the cock of the other pair had an infertile first clutch, and reared only one of the three hatched in the second. In 1952 a single pair laid eleven eggs late in the season, but did not sit.

Scarlet-chested Grass Parrakeet (*N. splendida*).—Recent results with this usually easy species were appalling. In 1950 a very fine cock had two eggs laid by his first mate, and they promptly vanished ; he was then given another hen who hatched three and four in successive clutches, but reared none of them. Another cock had an early clutch of seven from this hen, and when mated with the other did no more. In 1951 both hens broke their eggs, and one ultimately died egg-bound, and in 1952 one pair did not lay while the hen of a second pair also died egg-bound, and a new hen then hatched two young and they promptly died.

* * *

LONDON ZOO NOTES

By J. YEALLAND

A very attractive little collection of birds, a present from Sq./Ldr. K. C. Searle, was brought back from Singapore by Head Keeper Akhurst of the Aquarium.

It consisted of a Blue-rumped Parrot (*Psittinus cyanurus*), a Long-tailed Parrakeet (*Psittacula longicauda*), the most beautiful of the genus ; six Blue-crowned Hanging Parrakeets (*Loriculus galgulus*), and two Malayan Yellow-breasted Sunbirds (*Leptocoma jugularis microleuca*), new to the collection.

Other presentations include a Gannet (*Sula bassana*), a Yellow-casque Hornbill (*Ceratogymna elata*), and two Red-eared Bulbuls (*Otocompsa emeria*).

Two Abyssinian Ground Hornbills (*Bucorvus abyssinicus*), two of the handsome Goliath Herons (*Ardea goliath*), and two Black Pies or Piapiacs (*Ptilostomus afer*) have been purchased. It used to be thought that red-billed specimens of this Pie were females, but it is now known that only immature birds have red bills. On arrival from the Gambia it was found that one of the Ground Hornbills had some of the common African ticks, *Rhipicephalus sanguineus*, on its head.

Twelve young Budgerigars of the Woburn homing strain have been sent from Whipsnade and a few young ones have left the nests in the new aviary. Two more Crested Pigeons have been bred ; also a Bronze-wing, five Quaker Parrakeets, three Masked Lovebirds (blue-bred green), a Rosy-faced Lovebird, two Lesser Black-backed Gulls, a Herring Gull, and two Night Herons.

* * *

BRITISH AVICULTURISTS' CLUB

The forty-fourth meeting of the Club was held at the Rembrandt Hotel, Thurloe Place, South Kensington, S.W. 7, on Wednesday, 10th November, 1954, following a dinner at 7 p.m.

Chairman : Miss E. Maud Knobel.

Members of the Club : Miss P. Barclay-Smith, Miss K. Bonner, Mrs. V. M. Bourne, W. Brain, Captain A. Clarence, G. T. Clark, Mrs. G. T. Clark, W. D. Cummings, O. E. Dunmore, Miss S. A. Fothergill, F. Grant, H. J. Harman, Miss S. I. Hobday, H. J. Indge, G. T. Iles, P. H. Maxwell, Miss E. G. Perry, S. Porter, A. A. Prestwich, J. H. Reay, D. M. Reid-Henry, D. H. S. Risdon, R. C. J. Sawyer, P. Scott, E. N. T. Vane, N. S. Walker, H. Wilmot, J. Yealland.

Guests : J. Bailey, B. R. Cordwell, S. A. Croucher, Mrs. S. A. Croucher, Miss H. Gentry, Mrs. F. Grant, Miss S. Indge, H. M. Luther, Miss J. O'Connor, Mrs. J. H. Reay, Miss M. White, Mrs. H. Wilmot, W. A. Woods.

Members of the Club, 29 ; guests, 13 ; total, 42.

Peter Scott gave a brief review of some vanishing birds, California Condor, Whooping Crane, Hawaiian Goose, etc. He suggested the Society might use its influence in any attempt to persuade the conservation societies concerned to allow responsible breeders opportunities for increasing the numbers by breeding in captivity. D. M. Reid-Henry and Frank Grant took part in the discussion that followed.

The programme for the rest of the evening was confined to a conversazione.

The next meeting of the Club is on **12th January, 1955.**

ARTHUR A. PRESTWICH,
Hon. Secretary.

* * *

NEWS AND VIEWS

W. G. Teagle reports that the Pink-footed Goose hatched on the Long Water, Kensington Gardens, is now more than three months old.

* * *

The Ueno Zoo Park, Tokyo, has been successful in hatching one Manchurian Crane and two White-necked Cranes in an incubator.

* * *

The Convention of the American Pheasant Society was held on 5th, 6th, and 7th September, 1954, at Madison, Wisconsin. The Master Breeder's Award was given to our member Robert Gibson, of St. Helena, California.

* * *

The Bronze Medal of the Avicultural Society of South Australia has been awarded to F. E. Welford, for breeding the Golden-breasted Bunting ; to A. Phillips, Black-backed Wren, and to E. Baxter, Black-tailed Finch.

* * *

T. R. Holmes Watkins reports : " After a bad start four pairs of Splendids reared twenty-three very fine young (the same number as last year) ; two more were slightly rickety and were destroyed. Otherwise only Crimson-winged, Pennant's, and Princess of Wales's Parrakeets were bred—King, Pileated, and Brown's all failing."

* * *

Jendaya Conure—Major V. Dilwyn Jones has three strong young ones flying. Purple-capped Lory—Tom Spence has a young one, one

hundred days old. Pennant's Parrakeet—two reared at Dudley Zoo. Guiana Parrotlet—D. F. Castle, " two youngsters about three weeks old." Noble Macaw—E. N. T. Vane, three reared. Abyssinian Lovebird—Captain A. Clarence, two ready to leave the nest.

* * *

The deaths of several interesting birds have been recorded. San Diego Zoo : A Frazar's Oyster-catcher after more than twenty-three years in captivity, having been brought to the Zoo in July, 1930. Basle Zoo : A Condor that arrived 20th April, 1900. Whipsnade Zoo : P. H. Maxwell's Pesquet's Parrot, after over two years, possibly a longevity record for this very rare and difficult species.

* * *

Mrs. Ferne Hubbell, San Diego, writes : " I thought you might be interested to know that we crossed a male Pileated and a female Blue (Mealy) Rosella, and have three lovely birds that look like the Pileated. Also this year we reared two baby Finsch's Parrots ; they were eight weeks coming out of the nest—they are really beautiful.

Since 1950 we have reared nine Scarlet (Red and Yellow) Macaws from one pair."

* * *

The more discriminating aviculturists eagerly look forward to W. J. C. Frost's return from collecting trips to Malaya and New Guinea. The most recent collection consisted of the following : 1 Westermann's and 1 One-wattled Cassowary, 1 Palm Cockatoo, 1 Salawati King Parrakeet, 1 Narcissus Flycatcher, 5 Black-chinned Laughing Thrushes, 15 Painted Quail, 1 Plicated Hornbill, 3 Nicobar Pigeons ; 20 various Birds of Paradise, comprising Lesser, Twelve-wired, King, Hunstein's Magnificent, and Wilson's.

Frost has just left on yet another expedition.

A. A. P.

* * *

NOTES

CORRIGENDUM

Vol. 60, No. 5, September-October number, 1954, page 186 : for " Masked White " Zebra Finch read " Marked White " Zebra Finch.

BANANAS AS A FOOD FOR BIRDS

In the tropics the banana is the chief food given to many caged fruit-eaters. Some of the smaller sorts thrive solely on banana. There are many very fine and also many inferior varieties of this fruit. The latter are very indigestible even when fully ripened. The finer sorts do not last long enough to reach our shores, as the period of edibility lasts for but a day or two. It is these sorts on which tropical birds thrive best. Even the larger parrots will not thrive on inferior kinds yet I have known of a Macaw to thrive on sound banana as its chief food.

The banana of commerce is of a more lasting nature than some of the fancy kinds, keeping as it does for several days in an edible state. Nevertheless not until it is thoroughly ripe is it safe for many birds. Under-ripe it causes colic, frequently followed by deaths. Over-ripe it causes looseness, being then of no value.

Greenish-yellow bananas, whether with or without dark patches on the skin are unwholesome food for the smaller birds, and for that matter the larger parrots. A good test is that the skin peels off easily, neither breaking nor leaving any of it adhering to the fruit. Should any skin adhere to the fruit it should not be fed, as it is still undigestible in such a state. A thoroughly ripened banana has a golden yellow skin covered sparsely with light brown spots.

NEIL MACLEOD.

* * *

CORRESPONDENCE

THE USE OF NECTAR IN FEEDING BIRDS

I was very intrigued by the article and illustration of the Golden-fronted Woodpecker partaking of nectar food by J. Carpentier of the Antwerp Zoo.

Whilst I have not had experience of this particular species, the fact that it is a fruit-eating bird explains why it has taken the nectar, mainly, I think, because the sweetness compares with fruit juices. Old-standing members of the Avicultural Society and foreign bird enthusiasts will know me in the trade as specializing, over the last thirty-five years or so in Tanagers, Manakins, Fruitsuckers, and all the nectar-eating species, and will know that I have always advised feeding fruit-eating birds with sponge-cake or brown bread moistened with nectar, in addition to fruit. I have always fed so and I am certain that it must have saved me many thousands of pounds in preventing losses in fresh consignments.

Tanagers and Sugar Birds are generally packed with banana, which I consider a bad food. I find that fresh arrivals after taking the sponge-cake or bread, which they do straight away, will seldom touch banana again and my sole method for these birds is to give only orange in the way of fruit and for the Sugar Birds a jar of nectar.

I have never tried Tanagers with nectar itself, but no doubt they would drink it ; I like the cake and bread for roughage. I have, however, on occasions given pots of nectar to the larger birds arriving in very poor condition. I recently received some Greater Himalayan Barbets in very poor condition and in addition to the food mentioned above I gave a 2 oz. jar of nectar to each bird. They consumed two jars each day, and in a week, unless seen, one would never believe the difference in the condition. At the moment I have a female Cock-of-the-Rock which drinks about 2 oz. each day and a Red-crested Manakin which takes a similar amount.

I give nectar to all my stock, for finches and softbills I add it to the drinking water ; my food, however, differs from that used by Mr. Carpentier. Many years ago I cut out honey, condensed milk, and prepared invalid foods as they all turn sour overnight ; I use only Dextrine-Maltose ingredients which even in hot weather will not turn sour in 24 hours. My birds, from Humming Birds to Cock-of-the-Rock, do excellently on it. I trust these few notes will be of interest to our members.

P. H. HASTINGS.

182 SULTAN ROAD,
LANDPORT, PORTSMOUTH.

In his article (Sept.–Oct., 1954, issue) on " Woodpeckers in Captivity ", Mr. J. Carpentier seeks information on the use of nectar for birds other than those for which this preparation is normally provided.

This is a very intriguing subject, because when feeding Sugar Birds on this diet I always have on hand each day a surplus which is placed before my Superb Tanager, Golden-fronted Fruitsucker, and Black-headed Sibia. As these three birds proved extremely partial to this liquid food I gave a little to my Scarlet Tanager who likewise displayed a marked liking for it.

As a result of these experiments, which I carried out some time ago and from which the above-mentioned birds derived much benefit, I decided to put about half a teacupful in the main aviary to discover whether any other birds in my very mixed collection would be attracted by it. Imagine my surprise and delight when I found that not only did my Blue-throated Barbet and Indian Mynah regard it as a special treat but that they had to reckon with competition from Bulbuls, Pekin Robins, Ground Thrushes, Dyal Birds, and many kinds of seed-eating Finches. My pair of tiny Grey Singers, for example, drank it eagerly as did also Orange-cheeked Waxbills, Zebra Finches, and Tri-coloured Mannikins.

I have little doubt that, especially as a final evening feed in cold weather, nectar is a valuable supplementary diet for many birds for which it has, perhaps, been considered unsuitable. It is, I am sure, a very nourishing medium for any bird that can be induced to take it.

There are, we all know, many varieties of nectar preparations based on the general principle of honey, Swiss milk, and baby food. In respect of choice of components I have found that much depends upon the individual bird. One Blue Honey Creeper I have will not touch his mixture if a meat extract has been added. Nor have I found it desirable, except about once a week, to make use of any of the infant foods. I have a notion that too frequent use of them tends to produce fatness, particularly when birds (as not infrequently happens) are confined in cages where exercise is necessarily somewhat limited.

The whole question of bird nutrition, it seems to me, is one that should be studied very carefully, not merely in relation to species, but specifically (and this is of cardinal importance) to birds as individuals.

C. R. PODMORE.

49 GREYSTONES GRANGE ROAD,
ECCLESALL,
SHEFFIELD 11.

I was interested to read Monsieur Carpentier's article on the Golden-fronted Woodpecker living in the Antwerp Zoo.

I recently bought a Cuban Black-browed Woodpecker (*Melanerpes superciliaris*) and I find that it, too, is fond of the liquid Sunbird food. It also eats grapes, apple, and occasionally a little minced raw beef, but will not touch insectile mixture or mealworms, though these are offered daily. So far the bird is thriving; it is very active and calls a good deal, but it never pecks at the tree trunk in its aviary. Unlike the Antwerp bird, my Woodpecker is very aggressive towards other birds and an unfortunate White-eye that got into the aviary was quickly killed.

I have not been able to discover anything about the natural food of the Black-browed Woodpecker, but Gosse, writing about the Radiolated Woodpecker of Jamaica, says that it eats various fruits as well as wood-boring larvae and ants. It also damages the stalks of sugar cane and sucks out the juice, so I wonder whether any of the Cuban birds have similar tastes.

Like Monsieur Carpentier, I have found that other birds will also drink the Sunbird food and I believe it is good for them, especially the newly-imported small birds.

R. C. J. SAWYER.

226 HAGGERSTON ROAD,
LONDON, E. 8.

SUCCESSFUL BREEDING OF JENDAYA × BLACK-HEADED CONURES

These two birds which were owned by Mr. Rouwenhorst, of the Kroonstad district, nested in a very ordinary box approximately 10 inches square and some 22 inches high. Eggs laid, as far as knowledge serves, numbered three. First indication of any chicks was when about two-three weeks old; this was on Saturday, 20th February, 1954, when both my good friend Mr. Rough and myself inspected them at the request of the owner. They were then very well developed but still covered with grey down and showing hardly any feather.

These three chicks left the nest about four weeks ago (18th May, 1954). In all appearances they are very healthy birds and the characteristics of both parents can be seen. So far it is difficult to do any sexing as they are so very much alike but there appears to be two and one. The one carrying more yellow colouring about the head. However, all show yellow feathering amongst the head which, like the Black-headed Conure, is all black. Wings similar to the same—black beaks and black feet, all show yellowing on breast and abdomen.

The three chicks were acquired by me on 15th May, 1954, and the parents by Mr. Rough. The three chicks are now fully feathered and independent of their parents.

A. R. CARTHEW.

BOX 49,
VEREENIGING, S.A.

OXPECKERS

Whilst judging at a bird show at Southall in October of this year I was surprised to find among the exhibits two Oxpeckers or Tick Birds (*Buphagus africanus africanus*). If my memory is correct this is the first occasion that they have been exhibited alive here* and I do not recollect having ever seen them represented at the London Zoological Gardens. They were quiet when examined and in good health and plumage. Sitting partly upright on their perch they peered at one curiously. Their strong feet which enables them to clamber about the hides of herbivorous animals seemed fitted more for this purpose than perching, although they perch on trees and on native cattle-sheds. They were entered as " Blood Birds ", not altogether an unsuitable name. Ornithologists at one time differed as to what they actually ate. It seems, however, that not only are ticks eaten in quantity but stomach examinations include *diptera*, lice blood, tissue, and hair. Animals in bad condition with open saddle and gall wounds have such afflicted parts kept open by the birds pecking at flesh and sipping the blood. Much information on the habits of these curious birds has been contributed by Mr. Moreau and Major Cheeseman and others and requoted.

ALLEN SILVER.

LLANTARNAM,
MON.

* Mr. H. Witley owned living specimens previous to 1939.

MEMORIAL TO THE DUKE OF BEDFORD

On behalf of the Committee of the Duke of Bedford Memorial Fund, I write to say how gratifying the response, particularly from members of the Avicultural Society, has been.

Photographs of the aviary, the plaque, and the Memorial Trophy will be published in the AVICULTURAL MAGAZINE in due course, together with a final statement of the total amount of the Fund.

It is hoped that the present Duke will perform the ceremony of unveiling the plaque early next spring, and when the date is announced, donors wishing to attend the ceremony will be invited to communicate with me.

R. C. J. SAWYER,
Honorary Treasurer.

226 HAGGERSTON ROAD,
LONDON, E. 8.

CANDIDATES FOR ELECTION

A. BERKOUWER, Eendenkooi, Bakkerswaal, Lekkerkerk, Holland. Proposed by G. de Goederen.

Mrs. J. W. CAMERON, Paia, Maui, Territory of Hawaii. Proposed by A. W. Robison.

FRAU ERIKA DÖPFER, Hercules strasse 8, Kassel, Germany. Proposed by G. A. Gjessing.

Squadron-Leader C. EVERITT, 5 Brooklyn Grove, South Norwood, S.E. 25. Proposed by E. N. T. Vane.

Mrs. C. EVERITT, 5 Brooklyn Grove, South Norwood, S.E. 25. Proposed by E. N. T. Vane.

D. C. FRANKS, 249 Park Road, Uxbridge Common, Middx. Proposed by Miss K. Bonner.

K. W. GREENWAY, Park Lane, Long Handborough, Oxford. Proposed by Miss K. Bonner.

J. E. HARGREAVES, 256 Upper Batley Lane, Batley, Yorks. Proposed by C. Bates.

J. CH. HETHARIA, Oosterpark 13, Amsterdam, Holland. Proposed by A. A. Prestwich.

D. KENNEDY, Quitman, Georgia, U.S.A. Proposed by D. M. Johnson.

Squadron-Leader K. C. SEARLE, Station Officers' Mess, R.A.F., Changi, Singapore 17. Proposed by J. J. Yealland.

NEW MEMBERS

The thirteen Candidates for Election in the September–October, 1954, number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CHANGES OF ADDRESS

G. M. BAKER, to The Hermitage, Whitchurch, Shropshire.

HYLTON BLYTHE, to 1 Grand Parade, Tolworth, Surrey.

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